

COAL AGE

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If---

By BERTON BRALEY

Written expressly for
COAL AGE



If YOU was Supe of all the mine
You know just what you'd do,
You'd allus treat the miners fine
An' boost their wages, too,
YOU'D never rage around an' damn
A lazy miners' group,
YOU'D be as gentle as a lamb,
If you was Supe.

I KNOW, you'd make the old hole pay
Much better than it does,
You'd run her in a diffrunt way
You'd make her fairly buzz,
An' while you cut th' cost of coal
The wages you would whoop,
You'd be a Great an' Noble Soul,
If you was Supe!

AN' yet, I ain't exactly sure;
You MIGHT find out, you know,
That while your motives they was pure
An' clean as driven snow,
SOME guys would think yer kindness weak
An' play you for a dupe,
Or say you had a yellor streak,
If you was Supe.

YOU'D find the owners on yer back
Demandin' cent per cent,
An' labor leaders on yer track
Who'd never be content,
An' costs an' loss an' such would come
In quite a nightmare troop,
To put yer think-tank on the bum,
If you was Supe.

YOU'D find the job was pretty tough
An' full of care an' fret,
An' now an' then you'd act up rough
Like other supes you've met,
The one we have is kinda grim,
An' if you bossed the coop,
You MIGHT be just as bad as him,
If you was Supe!

Clean-Up Month

"Buy American-made Goods" is heard all over the United States. In the South, "Buy a Bale" and "Wear Cotton Goods" are popular slogans. And while the "Buy a Bale" movement will not move the cotton crop, it has a helpful value in expressing the willingness of Americans to aid one another in keeping business going. The purchase and use of American-made goods will be of tremendous value in increasing production and distribution of homemade products.

THERE has never been as much sentiment attached to the coal industry, as to the business of raising cotton. The one is an industry of hard facts and hard work, while the other has more or less of romance attached to it. When there is no market for coal the mines shut down and the workers, like the owners, simply shift the best they can until the demand comes again. People would not come forward in response to a slogan such as "Buy a Car of Coal" as they have to that of "Buy a Bale of Cotton," although coal will keep as long as cotton and more people are dependent on the industry.

But the owners and operators of coal mines, whether individuals or stockholders, are also facing serious problems. Many companies must curtail expenses, policies of retrenchment are in order, methods of strict economy must be observed; for when a mine can run but half or three-quarter time, it is a hard pull to keep ahead of fixed expenses coupled with the cost of such operations. Coal people need a slogan.

Those who run coal mines and study cost sheets know there are two great factors of expense, labor and material. The mines must be run with the least number of men essential to safe operation, and in times like these, they usually are. But wages will not be reduced until all other means are exhausted.

The second factor, that of material, can be given more vigorous treatment because here no individual or family is so vitally affected as when a man is laid off or his wages reduced. The slogan for mine operators, therefore, lies in the handling of this factor.

It is common knowledge that when times are good the censorship on orders is less rigid. There are coal-mining concerns in America—some of them among the best—who have more material in their storehouses than they dream of. These excess supplies include a large number of costly

machinery spares. There is many a scrap pile that contains good material that could be used to advantage in case of necessity.

In times like these, practical things are the only things worth while. Here is a practical idea for coal-mining companies.

Discover what you have on hand and use it now instead of continuing to order new material as you always do in good times. This idea can be expressed in the term "CLEAN-UP MONTH."

It can be carried out like this—

Institute a "CLEAN-UP MONTH" when no orders will be passed except for absolute essentials such as lubricants, explosives, etc. To make this effective, the supply house and storerooms about the mine should be carefully canvassed so as to exhibit all excess and obsolete or semi-obsolete stock; in fact, to show up what is on hand in the way of material that is always passed up in good times because it is easier to order more, but which is just as good as new if the men are made to use it.

Have the so-called scrap piles gone over thoroughly for good material suitable for use in emergency repairs. Many a superintendent has instilled ideas of economy into his master mechanic and made him fit to take care of minor breakdowns without rushing to the supply house for a new part. In fact, the best test of any man is the use he makes of what is at hand, rather than what he can do if given everything to work with.

The whole idea in "CLEAN-UP MONTH" will simply be to stop for a while the practice of ordering and using new material just because one can, when there is already something on hand that will do just as well. The adoption of such a slogan by coal-mining companies will be worth as much to them as the "Buy a Bale of Cotton" movement is worth to the cotton growers.

How many will try it?

Excavating Upward

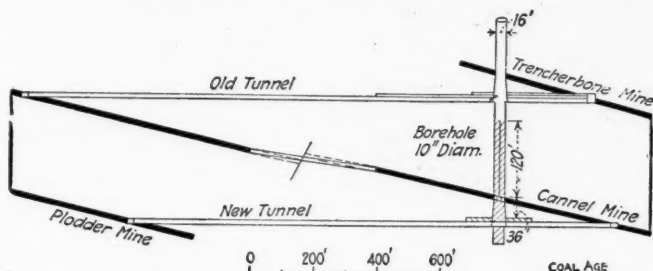
BY J. F. SPRINGER*

SYNOPSIS—In a certain English colliery it became necessary to extend an existing shaft in order to reach a lower coal measure. This work was accomplished from below, thus avoiding interference with hoisting in the original shaft.

We are so accustomed to think of shaft excavation as progressing downward, that we must regard the opposite procedure as truly novel. Not long ago, in an English coal mine, a considerable length of vertical shaft was opened from below upward.

At Newton Colliery, there are several coal seams which are sharply tilted. Two of these were, a long while back, worked from a single vertical shaft, which connected near its bottom with both seams by a horizontal tunnel. That is to say, the shaft penetrated through one seam to the strata lying between the two, but did not go down far enough to reach the lower measure. The horizontal tunnel met the coal stratum at a point a considerable distance to the north where the seam rises to a sufficiently high level.

The tunnel was used until the exhaustion of the coal easily accessible became more or less imminent. It was then desired to construct another horizontal tunnel 195



CROSS-SECTION THROUGH THE COAL MEASURES

ft. further down and to deepen the old vertical shaft to or below this level. The new tunnel would then afford connections with two of the tilted seams, though not precisely the same two as was the case with the upper tunnel.

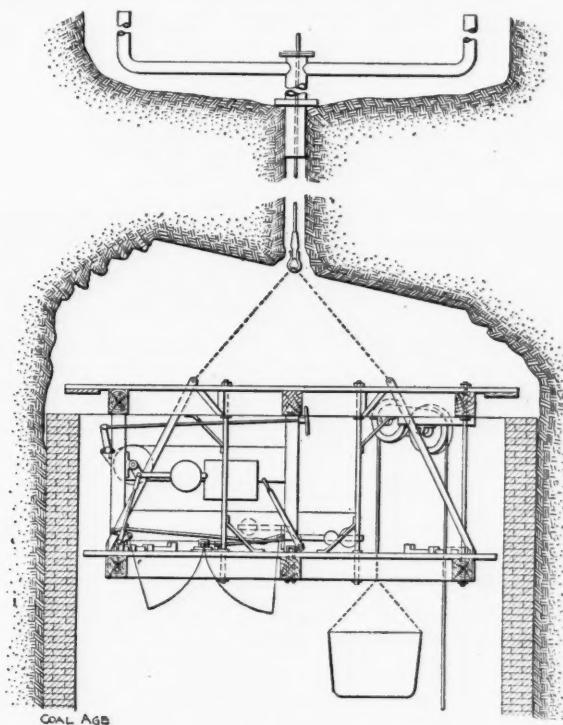
If the shaft had not been in active use for nearly the entire daily period of 24 hr., when the time came to deepen the shaft, the operation would have been quite simple. What was actually done was as follows: The tunnel was driven from the proper and accessible level of one of the seams, and the deepening of the shaft was carried out, in the main, from below upward. The work on the shaft extension was in this way carried out with but little interference with the operation of the shaft itself.

The point where work was commenced was not in the lower tunnel, but 36 ft. above it, where the lower one of the two original, tilted seams intersected the prolongation of the old shaft. The seam was now worked out in part and so there was suitable access. Between this point and the bottom of the shaft above was a vertical distance of about 120 ft. This region was now attacked by excavating upward.

A bore hole was put down from the bottom of the shaft to the place of beginning the work. This served to make it possible to use a plumb line and thus fix the position with some certainty. It served also as a means of ventilating the upcoming shaft and to furnish a way of using a cable in carrying on the work.

The putting down of this bore hole was accomplished without interrupting the operation of the old shaft. The workmen were protected by means of a strong cover. The material brought up to the bottom of the shaft was so slight in amount, that it was readily removed during the few hours when the shaft was free from its ordinary use.

Let us now proceed to the upward excavating operations. A double scaffold was employed by the excavators and other workmen. This was swung from a cable through



THE ARRANGEMENT FOR MAKING EXCAVATIONS UPWARD

the bore hole whenever it was necessary to move it. When at rest, the scaffold was secured in part by means of pins or prids, which were advanced radially from the scaffold into the shaft walls. Additional support was provided by packing up from the top of the brick lining of the shaft.

There were two floors to the scaffold, both circular. The lower one was of less diameter in order to allow for the presence of a brick lining wall in the shaft. The top deck was used by the excavators, and from it they drilled the holes for blasting, the most of which were nearly vertical. The trimming of the side walls was also done from this floor.

The lower floor provided support for the bricklayers working on the lining. The space between the two floors was left open, except that on one side the upper and lower floors were connected by walls. In this way a box-

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like compartment, 5x5 ft. in plan, was constructed.

Through the lower floor, opposite to the box, a hole 5x5 ft. in dimensions, was cut. The bottom of the box was a kind of trap-door, there being two leaves there installed opening downward. These leaves were normally held in place by heavy counterweights, heavy enough to prevent them from opening when only the weight of a workman was to be sustained. In addition, a strong screw brake and two trigger-catches were provided.

The men who worked on the top deck got to their positions from below by means of two openings in the sides of the box. In the space between floors, the pulleys were arranged, by means of which a bucket was raised and lowered through the 5x5-ft. opening in the lower floor.

The mode of operating was about as follows: The excavators would be hoisted in the bucket to the lower floor, whence they would pass into the box and thence to the top deck. They would get their blasts ready, and then withdraw to the bottom of the shaft. From this point or one off to one side, the explosives would be discharged.

The muck would fall onto the top floor of the scaffold or into the box. When the excavators returned to the lower floor, they either went through the openings in the walls of the box to the upper floor; or, if the way was

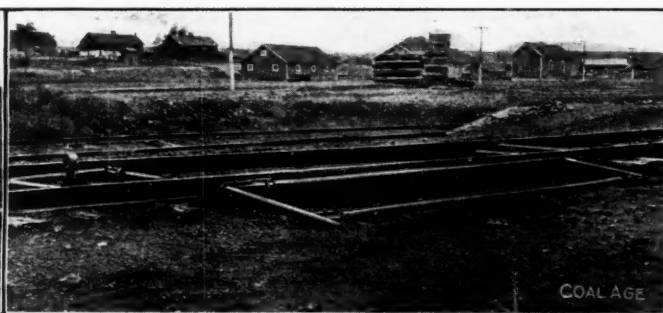
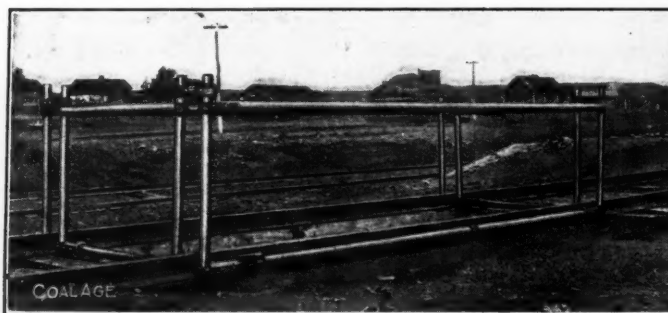
Safeguarding the Repair Pit

BY PENNSYLVANIA MINING ENGINEER

The pits constructed for the purpose of cleaning and repairing mine locomotives and coke machines are among the dangers encountered in and around coal mines. Frequently these pits are from 3 to 4 ft. deep and are walled up with stone, brick or concrete. Often, too, the edges of these walls are left sharp, and a fall into the pit might easily result in a serious or fatal injury. To avoid such an occurrence, the pits are frequently covered with planking or metal sheets. In either case, however, such covers are hard to handle. Wooden covers furthermore in time become more dangerous than no cover at all, due to the rotting of the timber.

To avoid the danger of an open pit at a certain plant of which I had supervision, I, with the aid of my blacksmith and machinist, designed the folding railing shown in the accompanying illustrations. When finished, in place and properly painted, this railing rather adds to than detracts from the appearance of the coke plant.

As may be seen in the photographs, such a railing was not hard to make, being built of second-hand pipe, and in the absence of fittings, 2x1½-in. flat iron bands. The 8



THE RAILING IN POSITION PROTECTING THE PIT AND FOLDED DOWN TO ALLOW LOCOMOTIVE OR COKE MACHINE TO PASS OVER

blocked by the presence of muck in the box, by means of emergency doors. The upper deck would now be cleared by getting the material into the box. This latter was then discharged through the two-leaved door.

It should be understood that whenever drilling was begun, the upper floor of the scaffold rested on the brickwork. The men doing the excavating would use props to protect themselves from the roof overhead. It is said that the drilling went on rapidly because the drills working overhead cleared themselves automatically.

It was important that no fastenings or other necessary accessories should be out of place; so the men—especially the foreman—would make sure of everything as they started in after each blast. Thus, it was a matter of considerable importance that nothing should go wrong with the two-leaved door.

As it was desirable to use the bottom of the old shaft overhead as a sump, a pipe was put into the upper end of the bore hole and sealed on the outside with clay and concrete. It was only necessary that the upper end of the pipe should project a little above the maximum level of water in the sump. If conditions had been such as to prohibit the presence or the drilling of the bore hole, the recurrent necessity of lifting the scaffolding could have been satisfied by means of jacks.

upright pieces of pipe, located two at each corner of the pit, are allowed to project 6 in. above the upper horizontal rail. Over the end of adjacent uprights is slipped a shackle or tie, which holds the side and end sections of the railing in a proper position. Removing these shackles allows the four sections of the railing to swing outward from the pit on hinges attached to the top timbers or to the web of the rails.

I have installed similar railings at other mines, and can say from experience that after one of these railings is once placed, it gives no further trouble and answers its purpose admirably. If kept properly painted to protect it from the sulphur smoke, which attacks all iron structures around a coke plant, it will last indefinitely.

When there is a repair pit to be guarded, it is far preferable to construct a suitable railing and see that the same is properly put in place and operated, than to put the job off until a coke-machine runner or some other valued employee has walked into it and broken his neck. The expense of installing such a railing as has been above described is small and may readily be the means of saving a doctor's or an undertaker's bill, a law suit or two, and possibly an indemnity; but what is vastly more important, it may save the life of a trusted and valuable employee.

Meeting of the American Institute of Mining Engineers

SYNOPSIS—The meeting of the American Institute of Mining Engineers in Pittsburgh, Penn., Oct. 8 to 10, was an unqualified success and showed that the field of coal, petroleum, iron and steel was as fertile as any the institute has ever cultivated.

On Oct. 8, the committees of the American Institute of Mining Engineers devoted to "Coal and Coke," "Petroleum and Gas," "The Use of Electricity in Mines," "Nonmetallic Minerals," "Iron and Steel," held a joint meeting in Pittsburgh, Penn., with headquarters at the Hotel Schenley. About 200 members were present.

At 2:30 p.m., a general session was held in the Lecture Hall of the Carnegie Institute, in the rear of the Museum. L. C. Morganroth read a paper on "The Occurrence, Preparation and Use of Magnesite." This is one of the bodies which comes to us from Austria and Hungary and the discussion seemed to favor the idea that it should continue to come from that source until better deposits than those existing here are discovered. Only a temporary use of native deposits could be expected, that use ending with the war.

The paper on "The Oil Fields of Mexico," by Ezequiel Ordoñez, was left for the meeting of the petroleum section on Oct. 10. That on "The Iron Industry in Brazil," by E. C. Harder, was read by the secretary, Bradley Stoughton. Geo. S. Rice delivered his own paper in brief, entitled "Investigations of Coal-Dust Explosions."

FIELD DIRT FOR IMMUNIZING COAL DUST

William Griffith desired to know whether field dirt had ever been used in the experiments for purposes of immunization. He said that mines did not have the crushing facilities needed for the making of stone dust and that the progress of the immunizing movement was held back by the idea, correct or incorrect, that the dust must be extremely fine which is used for that purpose. Until the Bureau makes experiments, as he showed, it is impossible to know just what are the indispensable specifications.

The paper of H. M. Chance was read only by title, as the author was absent. It was entitled "The Appraisal of Coal Lands for Taxation." R. V. Norris replied, stating his preference for a system of taxation on output. In rebuttal it was pointed out that while such a method might be reasonably equitable in the anthracite region because the companies were in general seeking to produce a maximum production, it was manifestly unjust in those portions of the country, in fact in all the bituminous-coal regions, because coal land tended to be held for a rise in value and consequently would not come into the market at all, if it were not taxed. In fact, taxation is desirable, as much for its liquidation of property as for the revenue it raises.

AN EXAMPLE OF FREEDOM FROM LAND TAXATION

One of the principal untaxed offenders is the federal government, which has put a paper value on coal lands which would be swept away in a year by an indignant

people if they had to pay taxes on their holdings, such as are paid by individual owners and operators.

R. V. Norris stated that the assessment of the coal in the anthracite region up to 1907 was on the basis of \$10 per foot-acre. Then the various counties increased it arbitrarily in some instances up to \$65 per foot-acre. They limited their assessments only by their taxation needs.

TAXATION AS A VEILED ROBBERY

In township of Hanover, Luzerne County, Penn., 97 per cent. of the taxes are obtained from the coal operators and owners, and that township recently spent \$200,000 in building two miles of highway. Mr. Norris mentioned an instance where the taxes on a piece of coal land were now \$2000 more per annum than the royalties which it realized. Owing to taxes being raised 163 per cent., the owner is the poorer every year by \$2000, because of his ownership of the property, yet he cannot break the lease.

There has been much contest relative to the assessment in the courts of the anthracite district, and the Supreme Court has ruled that estimates based on the foot-acre are not valid. In fact, William Griffith declared that it was not safe for any expert to declare on what he based his valuation. The only appraisal which has never been successfully contested is based on the foot-acre and on a number of considerations equally invalid according to an opinion of the Supreme Court, but the basis has not been revealed and consequently no attack can be made on the validity of the results. Had the methods of valuation been exposed in the court, those methods, scientific and equitable as they were, would have been ruthlessly thrown out. The court accepted them not on the basis of reason, but on the ground of the Latin dictum "*experto crede*."

THE INCOME-TAX INEQUITIES

S. A. Taylor called attention to the income-tax law for corporations. It permits, as administered, for 5 per cent. of the selling price of coal to be deducted from the profits for depletion of coal resources. This is ample in some sections of the country. On coal selling at an average of \$1.20 per ton at the mine, the deduction amounts to 6c., but Pittsburgh coal can only be secured at 15 to 20c. per ton, so there is an inequity in this rule of from 9 to 14c. Whenever royalty is paid, however, the gross amount of that payment, however large, can be deducted without trouble being made by the U. S. Treasury.

In the evening, an illustrated lecture on "Ancient Methods of Manufacture of Iron in China," was read by T. T. Read, in the Lecture Hall of the Carnegie Museum. This was followed by a moving-picture lecture on "Safety Methods in Mining," by J. W. Paul, of the U. S. Bureau of Mines, who exhibited three reels, showing methods of mining at Nanticoke, Penn. Edwin Higgins, of the same Bureau, showed two reels, exhibiting the methods of iron mining of Witherbee, Sherman & Co., at Mineville, N. Y.

A few people visited the Allegheny Observatory and sighted the "double double" or Epsilon Lyrae and the

moon, through the 30-in. photographic refractor and the 13-in. refractor, respectively.

J. TAFFANEL'S REGRETTABLE ABSENCE

On the second day, the party split into three parts, the "Iron and Steel," the "Coal and Coke" and the "Non-metallic" sections meeting separately. It will suffice to follow the discussion and papers of the "Coal and Coke" department. The first paper, that of J. Taffanel, on "Coal-Dust Explosion Investigations," was read by title as the author is a colonel in the French Reserves, and is needed at home. Liévin, where his experimental station is located, is at present writing on the firing line over which the Germans and French now pass back and forth in their death grapple.

H. N. Eavenson read a paper on "Coal-Mine Explosions Caused by Gas or Dust," and showed that the frequency of accidents from serious explosions, in which more than five lives are lost, is greatest in the winter months. Apparently foreign explosions do not show such a preference for cold weather. For instance, in Great Britain, while December leads in fatalities, June is second in this respect.

INCREASED NUMBER OF ACCIDENTS FROM EXPLOSIONS

The author adds that "in the coal mines of the United States, the total number of accidents and of fatalities due to explosions of gas or dust has been steadily increasing; there has been a slight increase in the number of accidents and a more decided increase in the number of fatalities per million tons produced; the serious explosions, causing five or more fatalities each, having been steadily increasing in actual number and number of fatalities as well as in the number of accidents and of fatalities per million tons produced; the number of accidents per mine, both serious and total, also shows a steady increase."

WHERE AMERICA AND EUROPE DIFFER

Geo. S. Rice called attention to the fact that the mingling of statistics of accidents from coal-dust and gas explosions had much to do with the showing which made summer conditions in some countries about as unfavorable as winter. He admitted, however, that a separation between those from one cause and another was almost impossible. He pointed out that most of the explosions in Europe were probably due to gas whereas in America, coal dust was perhaps the greatest menace.

R. D. Hall said that the very period of occurrence of winter in Europe is different from that in the United States. In fact, the last three months of the year are almost regarded as the winter in Europe whereas the first three are roughly so regarded here. One cause for the importance of coal-dust explosions in this country is the prevalence of room-and-pillar workings. The open faces in longwall leave room for release of violence in an explosion and dust explosions are not so likely to occur as they are where the blown-out shot or gas explosion originates in a restricted area, such as a heading, which resembles the bore of a cannon.

He called attention to the fact that longwall workings make ventilation difficult and consequently frequently cause gas explosions. For this, as also for other, reasons the mines of Europe are not as well furnished with air as those of the United States.

S. A. Taylor declared that it would be well to inquire into the possibility of gas being fired by the currents from wireless telegraph stations and said a recent British explosion had been ascribed to that cause.

H. A. Kuhn's paper on the "Pittsburgh Coal Field of Western Pennsylvania" was not read as he was not at the meeting to present it. The same is true of R. S. Lewis' paper on "The Book Cliffs Coal Fields, Utah," A. E. Gibson's on "An Aërial Tramway for Mining Cliff Coal," and M. B. Yung's on "Tin and Coal Deposits of the Fu Chuan District, China." Nor was there any discussion on these papers. J. P. K. Miller followed with his paper on "The Manufacture of Coke."

THE CEMENT-GUN WORK

At 12:40 p.m., the members of the "Coal and Coke" section took a special car to the Baltimore & Ohio R.R. station and the train to the experimental mine. It is perhaps unnecessary to add anything to what G. S. Rice and L. M. Jones will have to say in our next issue, relative to the demonstration at Bruceton, Penn. The cement-gun work attracted much attention and it might be well here to point out that unlike the sample work on the grounds, no reinforcement was used in its construction. The mixture of cement and sand in the proportion of one part cement to three parts sand was wetted with water at the nozzle and fired on the natural surface of the rock or old concrete which had to be covered.

This surface, though covered with soot and by no means ideal for bonding was not prepared for the reception of the gunite except that in places projections were broken off so as to make the surface less rough. It must be remembered that the gun itself sandblasts the surface. The rebound possibly moves much of such extraneous material as would interfere with bonding. This rebound of sand probably amounts to $\frac{1}{4}$ or $\frac{1}{3}$ of that used so that the cement mixture is probably two parts sand to one of cement. The sand which rebounds can be used again as it does not bond together in any way, for it is free of cement.

RESISTANCE TO EXPLOSION

The coating had stood a severe explosion prior to Oct. 9 when the members of the Institute saw it and it passed through the second ordeal with almost equal success. However, in the second explosion a patch about a foot square fell and this injury is supposed to have been due to putting on the coating too thick at one operation as it was two inches thick at that one point. The bonding had been made to bone coal.

Of course, the test for the cement gun is not an explosion test but one of weathering and the experimental mine is hardly the place for determining its value. There is reason to believe that the gun will prove useful for saving roofs from air-slaking. So long ago as 1911, G. S. Rice, the chief mining engineer of the Bureau, advocated a trial of its availability for such use.*

THE COAL MEN WERE SILENT

The other sections visited the McKeesport plant of the National Tube Co., the Homestead steelworks of the Carnegie Steel Co., and the Harbison-Walker brick plant. In the evening an informal subscription dinner was given at the Hotel Schenley in the Banquet Hall, S. A. Taylor

*"Some Special Uses of Concrete in Mining." Transactions of the National Association of Cement Users. Seventh convention. Vol. VII, 1911, p. 416.

presiding and B. B. Thayer, Bradley Stoughton, Charles F. Rand, Elmer Hiles, I. C. White, S. B. McCormick, George H. Neilson, Philip N. Moore, Edmund C. Pechin and E. G. Spillsbury being the speechmakers. Perhaps it would have been possible to give a little more prominence to the coal industry in the selection of speakers if only to compensate for long years of silence.

On Saturday morning, the 10th, three meetings were held, the "Petroleum and Gas" section, that of "Electricity and Miscellaneous Mining Topics" and that pertaining to "Iron and Steel." The first had two papers in which our readers will have no interest but the discussion which followed on gas and oil wells passing through coal seams has value to many coal men.

THE PLEA OF THE GAS INTERESTS

The gas men endeavored to show that they had provided most liberally for safety. W. E. Fohl stated that investigation showed that every explosion of gas from wells which had occurred had been caused by naked lights, and he advised the use of electric lamps in mines in which an influx of gas from a well is to be anticipated. The suggestion is good but it is a folly to overlook the fact that explosions of well gas may not always be so caused, may even have already resulted from some other agency than an open light. There are several possible sources of ignition and using electric lights, though advisable, is an insufficient insurance.

"BUNCHING" WELLS

As was stated, the gas and oil men have been placing their wells so close together as to interfere severely with mining. It might be possible to mine around a well symmetrically and let the measures fall without injury. But the frequency of the drilling makes this impossible and to leave an adequate pillar around such holes is an extremely expensive practice and one which spoils the mine and interferes with output.

It was alleged that the gas and oil men drilled altogether too many holes. Someone replied that no one went to the expense of drilling holes for recreation and the obvious reply was that this was not alleged. Excessive drilling is practiced because the oil or gas man desires a large output in a short time. He has, of course, just as much right to drill the earth like a sieve to hurry production as the operator has to keep him from drilling in order that he, the coal operator, can get out his coal without annoyance and danger. The rights are even. In fact, the majority of holes are by no means drilled "for fun," but for the purpose of removing the oil and gas from under the land of someone else or to remove the mineral wealth of one's own land so as to prevent it being purloined through the wells of another. As a matter of actual fact, excessive drilling has generally been considered a mistake and a source of loss to the industry as the pressure is reduced too rapidly and flooding results.

ROCK PRESSURE IS NOT A SIGN OF A GOOD WELL

There is a general belief that a well of no value is always one of low rock pressure, but rock pressure is a function of depth; of course it disappears in a well which is commercially valueless as soon as the gas or oil is allowed to escape but while the well is confined, pressure has little or no relation to the probable productivity of the well when the gate valve is opened. A worthless well

thoroughly plugged will develop as dangerous a pressure as the most productive of oil or gas wells and protection is needed against leakage of gas from such a well as much as from any other.

HOW MUCH ROCK CAN A GAS PIPE CONTROL?

The gas men believe that a little gas pipe surrounded with 2 or 3 in. of concrete will act as a pivot on which a million or more tons of rock will swing when the moment of collapse arrives. When at the Union Coal Co.'s mine, at Adamson, Okla., an area 1300x2600 ft. suddenly began to cave and 13 miners met death, what would have happened if a few gas lines with concrete facings stood in the way?

They would have snapped like the stem of a churchwarden pipe. Probably about a hundred million tons of rock fell when this Oklahoma mine let go. If only there had been a pipe with a concrete shell around it, what modification in the manner of descent of the rock would have been made by that fairy wand?

From such an atmosphere of misconception, one turns with relief to the meeting of the "Electricity and Mining Topics" Section upstairs. S. S. Rumsey and W. F. Schwedes had prepared a paper, entitled "A Test of Centrifugal Motor-Driven Mine Pumps." This was only read by title, but the discussion was animated, being led by the chairman of the committee on the "Use of Electricity in Mines," William Kelly. It was pointed out by R. V. Norris that a certain definite quantity and head for which the centrifugal pump should be designed should be provided if any efficiency was desired. Of course, by storage and interval operation the volume needed can be secured, but running the main station under varying load is uneconomical.

It was said that the reciprocating pump was also most efficient when working at a certain speed and passing a predetermined volume.

CENTRIFUGAL PUMPS IN FLOODED MINES

Difficulty arises in the pumping of acid water. R. V. Norris declared that if it is extremely acid it cannot be handled with a centrifugal pump, but Edwin Ludlow declared that by lining the pumps with Mannheim cement, acid water and even slush could be handled. He regarded the centrifugal pump as excellent for the dewatering of flooded mines. Those over which he had charge had to handle 25 tons of water for every ton of coal mined, and as a great part of that water came in from the surface on the occasion of heavy rains, it was necessary to keep spare equipment for occasional use. The centrifugal pump being less expensive than the reciprocating unit was better suited to this purpose. His pumps had bronze parts throughout.

It was stated by one of those present that a German centrifugal pump had been ordered for shaft sinking. It was designed to lift water under any head from zero to 800 ft. The nature of the means by which this adaptability to varying heads was secured, he was unable to explain as he did not understand the construction of the pump.

GASOLINE LOCOMOTIVES AND HEALTH

"The second paper was on "Gasoline Locomotives in Relation to the Health of Miners," and was read by O. P. Hood, chief mechanical engineer of the Bureau of Mines.

His remarks, on the whole, seemed quite favorable to the use of such equipment. R. V. Norris urged that the locomotives be kept on the main entries and not allowed to enter chambers. He stated that carbon monoxide caused lesions of both brain and kidneys and did not have merely a temporary effect on the person who inhaled it.

G. S. Rice said that when he first saw gasoline locomotives in England, France and Belgium, he had been much pleased with their performance and had hoped for their introduction into this country. However, these foreign locomotives were of the hit-or-miss type of ignition and the power was low, only about 4 or 5 hp. They were used only on small grades. The American market demanded locomotives of more capacity and perhaps that is the cause of some ventilating difficulties.

S. A. Taylor stated that he found that the motormen were disposed to turn on too much gasoline whenever any undesirable condition increased the load and, as a result, imperfect carburetion took place. He said he had placed his gasoline locomotive in the return airway, and graded the road carefully so as to equalize conditions, but he found he got an excess of monoxide if an additional wagon or heavier loads made an unusual demand on the locomotive.

W. G. Whildin said that he had used four different types of gasoline locomotives and found them uncertain in operation. He had found little trouble from imperfect carburetion, the miners and the motormen not being affected, although one morning, on starting, all four men were overcome and needed the pulmotor.

ADVOCATES CARBURETORS USED IN AUTOMOBILE PRACTICE

O. P. Hood thought that the difficulties mentioned could be met by changes in design and the employment of intelligent motormen. There are dangers inherent in the gasoline locomotives as there are in all mine appliances, in powder, for instance, but they should be guarded against and similarly gasoline locomotives should be operated with judgment and should not be discarded. The carburetors in the past have been built on a rugged type with simplicity as the watchword rather than efficient carburetion, and he advised that, in future, carburetors such as were used in automobiles should take the place of those now in mining use.

The third paper was on "Short Firing in Coal Mining by Electric Circuit from the Surface," by G. S. Rice and H. H. Clark. In the discussion, T. H. O'Brien, of the Stag Cañon Fuel Co., declared that the company was removing the electric switches placed at the mouth of every room, as they were not thought necessary now that the men do not charge their own holes. There is now no risk during the working hours, so the room switches are not necessary. Before, if a switch had been thrown on the heading, only the existence of the room switches would have prevented a general discharge of the holes, and a premature discharge from some other cause was always possible. To prevent this was the purpose of the room switch.

MISFIRES ARE DUE TO DEFECTIVE WIRES

He said that misfires were almost always due to defective wires. Only two defective detonators had been found in several months. When misfires occur, the men are not allowed to return to work till the shots have been fired on the succeeding night.

A general discussion then followed on the Use of Electricity in Mines. In the afternoon trips were made to the U. S. Bureau of Mines and the oil and gas district of Oakdale, Penn. The Bureau of Mines display was varied and interesting. Mr. McElroy, with a team of students in first-aid, described to the guests in an extremely competent way just how the first-aid work his team was doing should be performed and why.

ONCE AGAIN

There was a convincing thoroughness in both execution and description. Yet one matter roused question. Here was a patient with such a severe shock that to revive him the Shaefer method is adopted. He is recovered from death by the heroic efforts of the first-aid men and they then sit him up and begin to bandage his fingers and his head with picric-acid gauze.

There may be nothing wrong about that sitting up. We do not pretend to know. But we have learned that men are being demerited for it at American Mine-Safety Association and Red Cross meets. Why does the A. M. S. A. and the R. C. demerit if the Bureau of Mines persists in teaching that it is right. Or, *vice versa*, why does the Bureau teach it if it is wrong? And lastly, why do we so frequently have to mention this variation between the teaching of the Bureau and the action of the national associations? Surely some action should speedily be taken.

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Coal Mining Institute of America

The winter meeting of the Coal Mining Institute of America will be held Dec. 8 and 9, 1914, at the Fort Pitt Hotel, Pittsburgh, Penn.

On Tuesday, Dec. 8, the morning will be devoted to the business session, the election of officers and the president's address; the afternoon will be filled by the question box discussion conducted by W. E. Fohl. The following questions are proposed: Is the longwall system applicable to the Pittsburgh seam of coal? What is a safe voltage for use in coal mines? Do compensation laws increase or decrease accidents in coal mines? What are the advantages and disadvantages in the use of portable electric lamps?

Following the Institute dinner, at 6:30 p.m. (\$1.50 per plate), T. L. Lewis, of Columbus, Ohio, and H. H. Stoeck, of Urbana, Ill., will deliver addresses on "Government Control with Relation to the Coal-Mining Industry."

On Wednesday, Dec. 9, the following papers will be read: "Foreign Coal Trade of the United States," by Dr. E. W. Parker, Washington, D. C.; "Last Stand of the Mine Roof," by R. D. Hall, New York City, N. Y.; "Personal Observations in Alaska," by Dr. W. R. Crane, State College, Penn.; and "Coal-Dust Experiments at Experimental Mine, Bruceton, Penn.," by L. M. Jones, U. S. Bureau of Mines. Charles L. Fay, secretary-treasurer.

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Fourth Annual Banquet at Nanticoke

On the evening of Oct. 10 in the Broadway Armory at Nanticoke, Penn., was held the fourth annual banquet of the Nanticoke District Mining Institute. No less than 798 persons attended this banquet, and even then

not all who came could be accommodated. This was the greatest number of people ever banqueted in the building at one sitting, and there was consequently but scant room for the members of the Ladies Aid Society of the Methodist Episcopal Church, who served the diners, to move about. In spite of this handicap, however, both menu and service were excellent.

After the supper, John E. Kelley, president of the institute, reviewed the work of the organization during the past year. Mr. Kelley introduced the Hon. Peter A. O'Boyle as toastmaster, who spoke for several minutes, praising the work of the institute and encouraging its members.

J. G. Brecht, secretary of the State Board of Education, was next introduced. To him as well as to many others, the number of men present was a great surprise. Mr. Brecht's theme was the practical value of industrial education.

Franklin H. Ball, of Pittsburgh, and Superintendents Diffendorfer and Dixon, the latter of Newport Township schools, each spoke briefly on the subject of the evening. Gen. C. B. Dougherty also spoke briefly but with good effect.

The idea of industrial education is by no means new, vocational night schools having been established in the anthracite region for some time. This movement is, however, constantly growing in popularity, and each succeeding year sees a larger number of men enrolled, a larger number that complete the work, and what is vastly more important, a larger number that are able to successfully apply the knowledge they have acquired through their studies.

A Chemical Fuse Lighter

BY BARRY SCOBEE*

For many years it has been recognized that there is grave danger in the blasting of coal, in mines generating gas and in dusty mines where the coal is highly inflammable. In order to avoid the wholesale destruction of life, in mines where the use of powder for blasting appeared to be an essential feature in the mining of the coal, the suggestion has been adopted of employing shotlighters to fire the shots after the miners have left the mine.

While the employment of shotfirers has greatly reduced the death list, in those mines, the sad fact remains that, in many states, particularly in Oklahoma and in Kansas, many shotfirers have sacrificed their lives in the performance of their duties. That the work of shotfiring is dangerous, under the best conditions and that this danger cannot be wholly eliminated under conditions that are less favorable is freely admitted. For this reason, any device or method for avoiding the danger incident to shotfiring is worthy of careful consideration.

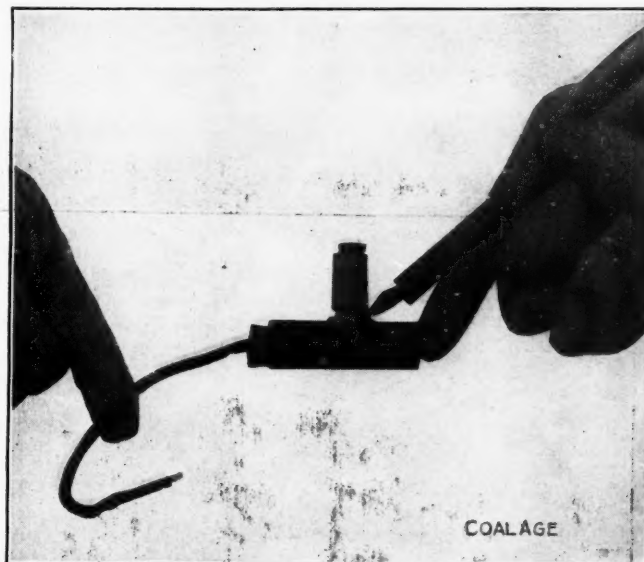
Now, comes the suggestion of a chemical fuse lighter, for which the chief advantage claimed is the fact that by its use the fuse is ignited from 2 to 3 hr. after the necessary connection is made. The suggestion comes from John Dowd, a former druggist of Radley, Kan.

It is stated that this contrivance was used by the shotfirers, in shaft No. 8 of the Hamilton Coal Co., at Radley, for 13 nights in succession. The test was made on 25 shots each night, with varying results, during the first nine nights, most of the shots, however, being

successfully fired each night. The last four nights every shot was fired except two; but the failure of these two shots to explode was found to be caused by other trouble and not due to any defect in the lighter. This showed that 98 out of 100 shots were successfully fired by the lighter, in the last four nights of the test.

Attention is drawn, in connection with this method of firing shots, to the danger of the powder becoming damp in the hole, before the fuse is ignited. This is particularly true where the drillhole is rough and jagged, and the paper wrappings of the charge are broken, thus permitting the dampness to reach the powder more readily. An important necessity, in employing this method, therefore, is the use of a drill that will bore a comparatively smooth hole.

The chemical fuse lighter is shown in the accompanying figure. It consists of a paper tube $2\frac{1}{2}$ in. long,



SHOWING CONSTRUCTION OF THE CHEMICAL FUSE LIGHTER

about the size of one's finger. One end of the tube is sealed with paraffin, while the other is closed with a common cork. Extending from one side of this tube, and at right angles to it, is a smaller celluloid tube having a cork in the top, like a bottle. At the junction of this small tube with the larger tube, as indicated by the pen point in the figure, is a thin diaphragm of celluloid, which closes the connection between the two tubes.

In the use of this device, the shotfirer pours about half a teaspoonful of sulphuric acid into the upright celluloid tube. It requires from 2 to 3 hr. for the acid to eat its way through the thin diaphragm and reach the combustible matter in the larger tube. This is fired by the action of the acid and in turn sets fire to the fuse that has been inserted through the cork in the end of the larger tube.

The device has not been manufactured, as yet, for the market; but it is claimed that it could be produced at a cost of from 2 to 3c. for each lighter. The idea is offered as a suggestion; and may lead to improvements that would reduce the cost of manufacture and make the device of greater utility in coal mining.

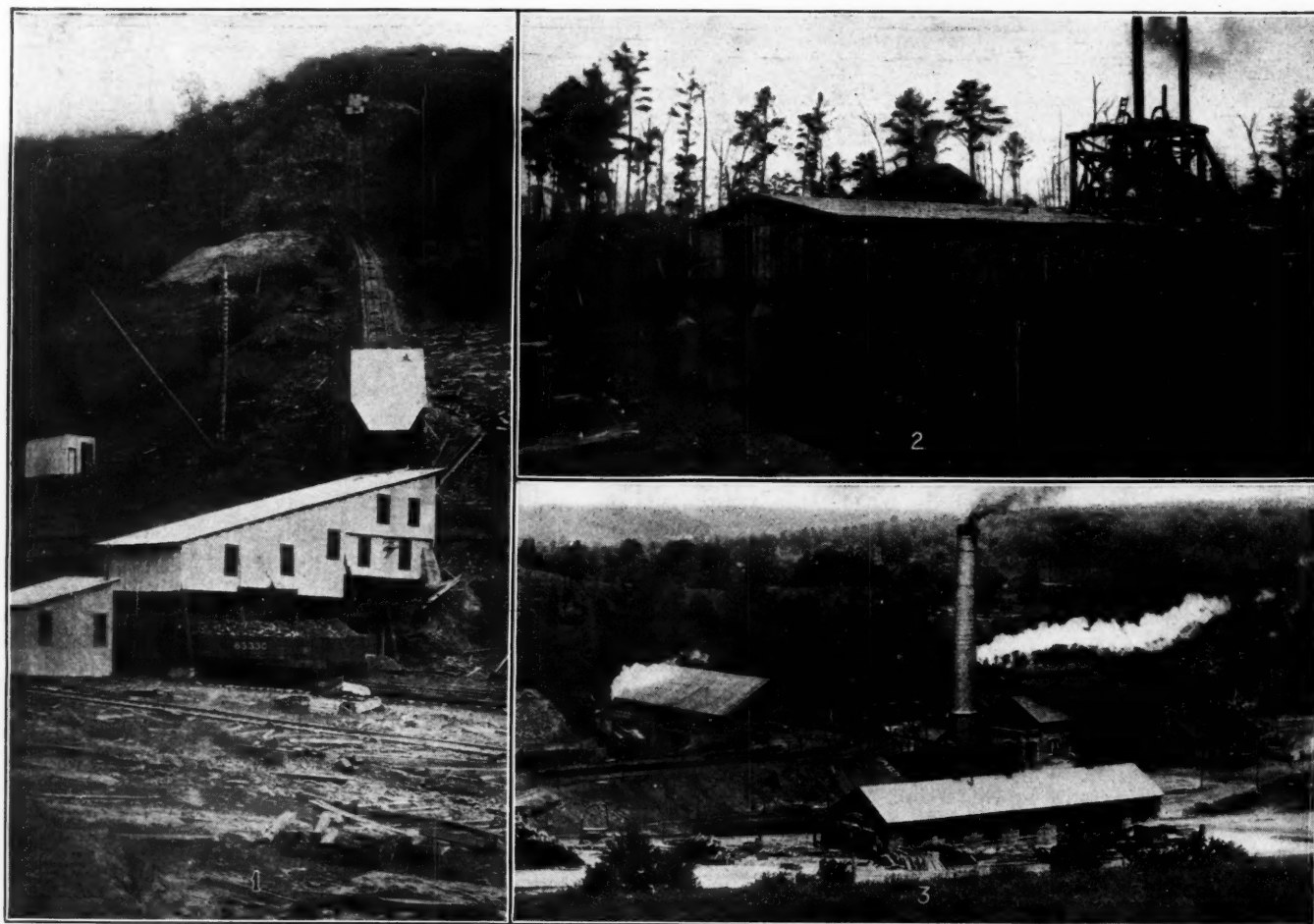
[This suggestion furnishes good material for discussion. Is the idea practicable?—Ed.]

*Pittsburg, Kan.

Snapshots In Coal Mining



EMPTIES BEING HAULED BY AN AIR-LOCOMOTIVE
AT KELLERMAN, ALA.



1.—INCLINE AT LEFAY, BELL COUNTY, KY. 2.—TIPPLE AND HOIST OF THE DE SOTO COAL CO., MORRIS,
ALA. 3.—CONSOLIDATED COAL CO.'S MINES AND CENTRAL POWER STATION AT JENNERS, PENN.
THE POWER PLANT SERVES MINES HAVING AN OUTPUT OF 8000 TONS DAILY

The Purchase of Coal on Specifications--IV

By F. R. WADLEIGH*

SYNOPSIS—The fourth and concluding article of this series. This section is confined to abstracts from typical specifications for the purchase of coal. There is a wide range of selection including both domestic and foreign contracts.

At an informal meeting of the committee appointed by the American Society for Testing Materials, held in New York in May, 1914, a proposed form of "Specification and Contract for the Purchase of Coal for Use in Steam Power Plants" was submitted for discussion, a copy having been previously sent to each member for written comments. Below are given in detail:

1. Extracts from the minutes of the meeting, showing the consensus of opinion regarding such contracts and what they should include in the way of specifications.

2. Those parts of this contract referring especially to sampling and analysis.

It is thought that this information may be somewhat of a guide to those interested in the buying and selling of coal, since it gives the ideas of those who have had much practical experience in handling specification contracts, from every standpoint. It may also give a better understanding of the subject and result in the weeding out of unfair and impractical specifications.

It was decided to make no formal report this year, as the purchase of coal under specifications is in a development stage, and it was thought that the time had not yet arrived for the actual setting forth of a standard. To show that this method is still developing, the following questions were discussed:

1. Ash content and B.t.u. value have been and are widely used as factors for establishing the quality of coal bought under specifications, but the general conclusion has been reached that regular B.t.u. determinations on every sample are unnecessary, where all the coal comes from the same region and bed. In such case the B.t.u. value varies proportionately with the ash content, which, therefore, becomes a measure of heating value. When coal comes from different beds or regions, then B.t.u. values and analysis are of value.

2. Very few specifications in use make any mention of the clinkering qualities of coal, although this matter is of great importance and should be covered in all specifications. The fusing temperature of ash is used to measure this, but its method of determination should be further investigated, before definite recommendations can be made.

3. Moisture specification were also discussed. Neither the "as received" nor the "dry" basis have proved altogether satisfactory. Moisture in coal is variable; its exact determination in any shipment is difficult, because of uncontrollable losses, and its amount is largely accidental. To use the "dry-coal" basis may give inaccurate values when coals of different nature are compared. In fact a satisfactory way of handling the moisture question has not yet been evolved.

4. Alternate methods of analysis are not desirable; a standard specification should always specify one standard method. The question of weights was also discussed, but no conclusions arrived at.

EXTRACTS FROM PROPOSED SPECIFICATIONS AND CONTRACT FOR THE PURCHASE OF COAL FOR USE IN STEAM POWER PLANTS

VII—SAMPLING

11. **Company Privileged to Be Present.** The company shall have the privilege of having a representative present to witness the collection and preparation of the samples to be forwarded to the laboratory.

12. **Method.** The samples shall be collected and prepared in accordance with the method given in the appendix attached hereto as a part of these specifications and contract.

Note—As payment for coal delivered under this contract is to be based upon the quality as shown by analyses of representative samples, it is imperative that every sample be collected and prepared carefully and conscientiously and in strict accordance with the method agreed upon herein, for if the sampling is improperly done, a determined price, based on the analysis, would be in error, and it may be impossible or impracticable to take another sample; but if an analysis is in error, if desired, another analysis can easily be made of the original sample by a laboratory mutually satisfactory.

Gross samples of the quantities designated in the appendix must be taken whether the delivery consists of a few tons or several hundred tons, because of the following cardinal principle in sampling coal, which must be recognized and understood. The effect of the chance inclusion or exclusion of too many or too few pieces of slate or other impurities in what, or from what, would otherwise have been a representative sample, will cause the analysis to be in error accordingly, regardless of the tonnage sampled. For example, the chance inclusion or exclusion of, say, 10 lb. too much or too little of impurities in or from an otherwise representative sample of 100 lb., would cause the analysis to show an error in ash content and in heat units of approximately 10 per cent., whereas for a 1000-lb. sample, the effect would be approximately only 1 per cent. the effect being the same whether the sample was collected from, say, a one-ton delivery or from a delivery of several hundred tons.

VIII—ANALYSES

13. **Laboratory and Method.** The samples shall be immediately forwarded to the laboratory, and they shall be analyzed and tested in accordance with the method recommended by the American Chemical Society and by the use of a bomb calorimeter. The expense of such analyses and tests shall be borne by the consumer. The results, together with the corrected price per ton, shall be reported promptly to the company.

14. **Settlement of Disputed Results.** Should the company question the reported results—except the moisture results, which are to be considered as final—the consumer shall, if requested by the company within five days after its receipt of such report, send the third sealed part or parts of the sample or samples held by the consumer, as provided for in paragraph 6 of the appendix, to the following laboratory, mutually agreed upon:

If the results in question represent the average of the analyses of two or more different samples, then the laboratory agreed upon shall analyze each sample separately and average the analyses, giving each analysis a weight proportionate to the tonnage that it represents. The results obtained by the laboratory agreed upon shall be considered as final. In case reports reported by the laboratory agreed upon shall be within 150 B.t.u., or 1 per cent. ash, or 2 per cent. volatile matter, or 0.25 per cent. sulphur of the questioned factor or factors, then the charge of the said laboratory shall be borne by the company, but if the disputed factor or factors shall be found to vary by more than these margins, then the charge shall be borne by the consumer.

IX—DESCRIPTION OF COAL DESIRED BY THE CONSUMER

15. **Kind and Quality.** The coal must be a good (coking, noncoking) coal, free from excessive dust, and must approxi-

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mate in quality the following proximate analysis and heating value:

Moisture in "delivered coal"	per cent.
Volatile matter in "dry coal"	per cent.
Ash in "dry coal"	per cent.
Sulphur in "dry coal"	per cent.
British thermal units in "dry coal"	per cent.

16. Size of Coal.

X—DESCRIPTION OF COAL OFFERED BY THE COMPANY

17. **Price Per Ton.** The company hereby agrees to furnish coal of the character and quality specified in paragraphs 18 and 19 below, and from the mine or mines specified in paragraph 20 below, in accordance with all of the conditions and requirements of this contract, at \$.... per ton of 2240 (or 2000) lb.

18. **Size.** Coal will be furnished of the size specified in paragraph 16, under Sect. IX, "Description of Coal Desired by the Consumer."

19. **Analysis Guaranteed.** The coal herein specified shall show the following analysis:

Moisture in the coal "as received"	per cent.
Volatile matter in "dry coal"	per cent.
Ash in "dry coal"	per cent.
Sulphur in "dry coal"	per cent.
British thermal units per pound in "dry coal"	per cent.

20. **Source.** The source of the coal herein specified shall be as outlined below:

Name of mine or mines	
Location of mine or mines (town, county and state)	
Name or other designation of coal bed	
Name of operator of mine or mines	
Commercial name of coal	
Railroad on which mine or mines are located	

Note—Bids not supplying the foregoing information may be considered informal and may be rejected.

Coal of the description and analysis above specified is herein known as coal of the contract grade. Bidders are cautioned against specifying higher standards than can be maintained, for to do so will result in deductions in price and may result in the rejection of delivered coal or the cancellation of the contract. In this connection, it should be recognized that the small "mine samples" usually indicate a coal of higher economic value than that actually delivered in carload lots, because of the care taken to separate extraneous matter from the coal in the "mine samples."

VIII—PRICE AND PAYMENT

28. **Determination of Price.** The consumer hereby agrees to pay the company, during the calendar month following delivery, for each ton of 2240 (or 2200) lb. of coal delivered and accepted in accordance with all the terms of this contract, the price per ton determined by taking the analyses of the samples, or the average of the analyses, if more than one, upon the basis of the price herein named in paragraph 17 above, adjusted as follows for variations in heating value, ash content and moisture content from the standard guaranteed herein, in paragraph 19 above, by the company:

(a) **Heat Unit Adjustment.** When the coal is considered on a "dry coal" basis, no adjustment in price shall be made for variations of 2 per cent. or less in the number of British thermal units from the guaranteed standard. When the variation in heat units exceeds 2 per cent. of the guaranteed standard, the adjustment shall be proportional and shall be determined by the following formula:

B.t.u. delivered coal ("dry coal" basis) \times bid price =
B.t.u. ("dry coal" basis) specified in contract
price resulting for B.t.u. variation from the standard.
The adjusted price shall be figured to the nearest tenth of a cent.

As an example, for coal delivered on a contract guaranteeing 14,000 B.t.u. on a "dry coal" basis at a bid price of \$3 per ton that shows, by calorific test, results varying between 13,720 and 14,280 B.t.u., there would be no price adjustment. If, however, by way of further example, the delivered coal should show by calorific test 14,300 B.t.u. on a "dry coal" basis, the price for this variation from the contract guaranty would be, by substitution in the formula.

$$\frac{14,300}{14,000} \times \$3 = \$3.064$$

(b) **Ash Adjustment.** No adjustment in price shall be made for variations of 2 per cent. or less below or above the guaranteed percentage of ash on the "dry coal" basis. When the variation exceeds 2 per cent., the adjustment in price shall be determined as follows:

The difference between the ash content by analysis and the ash content guaranteed shall be divided by 2, and the

quotient shall be multiplied by the bid price, and the result shall be added to, or deducted from, the price adjusted for British thermal units, or the bid price if there is no adjustment for British thermal units, according to whether the ash content by analysis is below or above the percentage guaranteed. The adjustment for ash content shall be figured to the nearest tenth of a cent.

As an example of the method of determining the adjustment in cents per ton for coal containing ash varying by more than 2 per cent. from the standard, a coal may be considered that has been delivered under a contract guaranteeing 10 per cent. ash at a bid price of \$3 per ton. If the coal shows by analysis an ash content of 13.26 per cent., the adjustment in price would be determined as follows:

The difference between 10 and 13.26, which is 3.26, would be divided by 2, and the quotient of 1.63 multiplied by \$3, resulting in an adjustment of 4.9c. per ton, which in this case would be a deduction.

(c) **Moisture Adjustment.** The price shall be further adjusted for moisture content in excess of the amount guaranteed by the contractor, the adjustment being determined by multiplying the price bid by the percentage of moisture in excess of the amount guaranteed. The adjustment, which is a deduction, shall be figured to the nearest tenth of a cent.

As an example, a coal may be considered that has been delivered under a contract guaranteeing a moisture content of 3 per cent., the price bid being \$3 per ton. If, on analysis, the coal shows 4.58 per cent. moisture, the bid price should be multiplied by 1.58 (representing excess moisture), giving 4.7c. as the deduction per ton.

APPENDIX

METHOD OF SAMPLING COAL DELIVERIES

To be attached to and to become a part of the Specifications and Contract issued by for the purchase of coal for the period commencing and ending

1. **During Unloading.** The coal shall be sampled when it is being unloaded from railroad cars, ships, barges or wagons, or when discharged from the company's supply bins, or from industrial railway cars, or grab buckets, or from the coal-conveying equipment at the power plant, as the case may be and as may be mutually agreed upon.

2. **Size of Increments.** To collect samples, a shovel or specially designed tool or mechanical means shall be used for taking portions of increments of 10 to 30 lb. of coal. For slack or small sizes of anthracite, increments as small as 5 to 10 lb. may be taken. The size of the increment shall depend on the size and weight of the largest pieces of coal and impurities.

3. **Collection of Gross Sample.** The increments shall be regularly and systematically collected, so that the entire delivery will be represented proportionately in the gross sample. The frequency of collecting the increments shall be regulated so that a gross sample of not less than 1000 lb. shall be collected. If the coal contains an abnormal amount of impurities, such as slate, and if the pieces of such impurities are very large, gross samples of 1500 lb. or more, as may be mutually agreed upon, shall be collected. For slack coal, and for small sizes of anthracite, if the impurities do not exist in abnormal quantities or in pieces larger than three-quarters of an inch, a gross sample of approximately 500 lb. shall be considered sufficient. The gross sample shall contain the same proportion of lump coal, fine coal and impurities as is contained in the coal delivered. As the increments are collected, they shall be deposited in a waterproof receptacle having a tight-fitting lid and provided with a lock.

4. **Quantity Represented.** A gross sample of the size specified above shall be taken for each 500 tons or less.

5. **Preparation.** After the gross sample shall have been collected, it shall be systematically crushed, mixed and reduced in quantity to convenient size for transmittal to the laboratory. The crushing shall be done by a mechanical crusher or by hand with a tamper on a smooth and solid floor, or, in the absence of a smooth, tight floor, the crushing shall be done on a heavy canvas, to prevent the accidental admixture of any foreign matter. The mixing and reduction shall be done by hand with a shovel, or mechanically by means of riffles or sampling machines.

6. **Hand Preparation.** When prepared by hand, the pieces of coal and impurities shall be crushed to the approximate size indicated in the table below before each reduction:

Weight of sample to be divided	Size to which coal and impurities should be broken before each division.
1000 lb. or more	1" in.
500 lb.	3/4" in.
250 lb.	1/2" in.
125 lb.	3/8" in.
60 lb.	1/4" in.

The 60-lb. sample shall then be reduced by quartering, or by the use of riffles or sampling machines, to about 15 lb. This 15-lb. part shall be thoroughly mixed and divided into three equal parts. Each part shall be placed in an air-tight glass jar or metal can which shall bear an unbroken seal. One of the samples shall be forwarded to the laboratory, named in paragraph 15 of the contract proper, one shall be turned over to the company, and the third shall be held by the consumer. Should the analysis be questioned by the company, the third sample shall be forwarded to the laboratory mutually agreed upon and named in paragraph 14 of the contract proper.

7. Mixing and Reduction by "Alternate Shovelfuls." After each crushing, the sample, if prepared by hand, shall be thoroughly mixed before reduction in quantity, the procedure being as follows:

The crushed coal shall be shoveled into a conical pile. A new long pile shall then be formed, the shoveler taking a shovelful at a time and spreading the coal out in a straight line (8 to 10 ft. long for a shovel holding about 15 lb.). Each new shovelful shall be spread over the top of the preceding one, the shoveler beginning at one end of the pile for the first shovelful and at the other end for the succeeding shovelful, and so on, the pile being occasionally flattened with the flat side of the shovel, until all the coal has been formed into one long pile. The shoveler, by walking around the long pile, advancing a distance equal to the width of the shovel, and systematically taking shovelfuls, and shoveling the coal to one side, alternate shovelfuls being discarded, shall cause the sample to be halved in quantity.

8. Mixing and Reduction by "Quartering." The above "long-pile" and "alternate-shovel" method of mixing and reducing the sample shall be followed with samples of 125 to 250 lb. or more. Samples smaller shall be mixed on a canvas about 8 ft. square by raising first one end of the canvas and then the other, the sample being thereby rolled back and forth. After the sample shall have been thoroughly mixed in this manner, the four corners of the canvas shall be gathered up, and the sample shall be formed in a conical pile and reduced in quantity by quartering, as follows:

The cone shall be flattened, its apex being pressed down with the back side of the shovel, or with a board, so that each quarter contains the material originally in it. The flattened mass, which shall be of uniform thickness and diameter, shall then be marked into quarters, with a board held edgewise, or with a piece of sheet iron, along two lines that intersect at right angles directly under the apex of the original cone. The diagonally opposite quarters shall then be shoveled away and discarded and the space that they occupied brushed clean. The coal remaining shall be successively crushed, mixed, coned and quartered on the canvas until two opposite quarters shall equal the quantity (approximately 15 lb.) required to fill the three containers mentioned in paragraph 5 above.

9. Progressive Crushing of Increments. Whenever the different increments of samples are collected throughout some considerable period of time, each increment, or an accumulation of a number of increments, may be crushed as soon as taken and the pieces of coal and impurities may be broken sufficiently small to permit two or three, or more, reductions of the total accumulated sample before further crushing shall be necessary.

10. Extended Deliveries. If deliveries extend over any considerable period, what would otherwise be a gross sample may be worked down in successive stages to samples of a size suitable for transmittal to the laboratory, and these samples, which shall be approximately equal in quantity, and shall represent the several equal parts of a delivery, may be analyzed and the several analyses averaged, or the several samples may later be mixed at the delivery point or in the laboratory and reduced to one sample, one analysis being made.

11. Special Moisture Sample. In the reduction of the gross sample to the sample for transmittal to the laboratory, the gross sample will unavoidably lose moisture. To determine the moisture content in the coal delivered, a separate special moisture sample must be taken.

12. Collection of Moisture Sample. The special moisture sample shall contain approximately 100 lb., and shall be accumulated by placing in a waterproof receptacle, with a tight-fitting and waterproof lid, small parts of the freshly taken increments of the gross sample, or they may be collected separately and independently of the gross sample. The accumulated moisture sample shall be immediately crushed and reduced mechanically or by hand to about a 5-lb. quantity, which shall be immediately placed in a container and sealed air tight and forwarded to the laboratory. If prepared by hand, it shall be rapidly crushed so that no piece of coal or impurities are larger than one-half inch,

and it shall be rapidly reduced by the "quartering" method on a canvas to the 5-lb. quantity.

13. Moisture Samples Discretionary. The collection of special moisture samples shall be discretionary with the consumer.

14. Moisture Samples May Represent Any Part of Delivery.

15. Sampling of 50 Tons or Less Discretionary. When orders are issued for 50 tons or less, sampling shall be discretionary with the consumer, and if samples are not taken, the bid price per ton shall be paid, but all coal so delivered may be rejected if it shall give unsatisfactory results because of excessive clinkering, or excessive ash-pit refuse, or a prohibitive amount of smoke, or any other cause that makes it an undesirable fuel.

There are many other forms of specifications in use in this country. Probably the one on which most of the coal has been bought is that used by the U. S. Government, prepared by the Bureau of Mines under which, for the fiscal year of 1913, 1,374,000 tons of coal were bought. These specifications are given in full in Bulletin 63, by George S. Pope, engineer in charge of the Inspection of Government Coal Purchases. Another type of specifications originally prepared by the Fuel Engineering Co., of Chicago, is much used, while nearly all of the large electric-light and power companies and state and municipal power plants have their own forms. As the various types are now quite well known and have been much discussed in different publications, they will not be given here; none of them are entirely satisfactory to the sellers of coal and some are absolutely unfair.

Some of the technical features of specifications used abroad are of interest, and may show different viewpoints of the whole matter, from which we may get new ideas. Extracts are therefore given below from some typical foreign specifications.

ASSOCIATED MUNICIPAL ENGINEERS, LONDON (Extracts From Specifications)

Tenderers are requested to tender for coal to be supplied in accordance with either or both of the following alternative specifications: Specification (A) For coal of a particular description, hereinafter described as "Named Coal;" Specification (B) For coal guaranteed to have definite physical qualities as a fuel for steam-raising purposes, hereinafter described as "Guaranteed Coal." In the specification of "Named Coal," the tenderer is required to set out in the tenderer's details: (1) The name of the pit from which the coal will be delivered; (2) The description applied to the particular class of coal from the colliery; (3) Size as specified by the colliery. In the specification of "Guaranteed Coal," the tenderer is required to set out in his details the classes of coal for which he is tendering, corresponding with the classes referred to in the table of standards.

TESTING

A. A representative sample shall be taken on delivery from each or any consignment and shall be divided and sealed in three air-tight vessels; the contractor shall be at liberty to be represented when the sample is taken and shall be entitled to one portion thereof. The contractor shall have no opportunity at a later date of objecting to the manner in which the coal has been sampled.

B. Samples taken in the manner herein defined shall be taken from each consignment and tested by the purchaser, or in the event of dispute, by a competent expert, who shall be approved from time to time by the purchaser, and whose fees shall be paid by the contractor if the purchaser's test is confirmed. The tenderer is invited to set out in the tenderer's details the names of three experts either of whom he is agreeable shall be employed.

BONUS AND PENALTY

No variation of the contract price shall be made for any variation from the standard not exceeding one-twentieth, up or down of the figures given in the table of standards.

A. If the calorific value exceeds the standard value in British thermal units per pound, the price per ton shall be increased in the same percentage ratio as the increase in the calorific value.

B. If the calorific value be less than the standard value in thermal units per pound, the price per ton shall be de-

creased in the same percentage ratio as the decrease in calorific value, provided always that the purchaser shall have the right to reject the whole consignment if the calorific value be more than $7\frac{1}{2}$ per cent. below the standard.

C. If the moisture be less than the standard percentage by weight, the weight of coal to be paid for shall be increased beyond the quantity actually weighed out by a percentage equal to the percentage decrease of moisture.

D. If the moisture exceeds the standard percentage by weight, the weight of coal to be paid for shall be decreased below the quantity actually weighed out by a percentage equal to the percentage increase of moisture. Provided always, that the purchasers shall have the right to reject the whole consignment if the total moisture exceeds one and a half times the moisture given in the table of standards.

E. If the percentage of small coal be less than the standard percentage by weight, the weight of the coal to be paid for shall be increased beyond the quantity weighed out by a percentage equal to one-quarter of the percentage decrease of small coal, percentages to be taken on the bulk and not on the standard.

F. If the percentage of small coal exceeds the standard percentage by weight, the weight of the coal to be paid for shall be decreased below the quantity actually weighed out by a percentage equal to one-quarter of the percentage increase of small coal, provided always that the purchasers shall have the right to reject the whole of the consignment if the proportion of small coal exceeds 25 per cent. by weight, percentages to be taken on the bulk and not on the standard.

TABLE OF STANDARDS TO BE APPLIED IN CONNECTION WITH GUARANTEED COALS

	B.t.u.	Moisture Per Cent.	(Small Coal) Through Inch Square Mesh	Per Cent.
A. Bituminous Durham and Yorkshire.				
1. Washed double nuts	13,250	8	$\frac{1}{2}$	15
2. Washed single nuts	13,000	9	$\frac{3}{8}$	$17\frac{1}{2}$
3. Washed peas	12,750	10	$\frac{1}{4}$	20
B. Bituminous Scotch Washed Coals.				
1. Washed double nuts	12,750	10	$\frac{1}{2}$	15
2. Washed single nuts	12,500	11	$\frac{3}{8}$	20
3. Washed peas	12,000	13	$\frac{1}{4}$	20
C. Semi-Bituminous and Pseudo-Anthracite, Welsh Washed Coals.				
1. Washed large nuts	14,500	5	$\frac{1}{2}$	15
2. Washed small nuts	13,900	6	$\frac{3}{8}$	20
3. Washed peas	13,350	6	$\frac{1}{4}$	20
D. Bituminous Durham and Yorkshire Dry Screened Coals.				
1. Double nuts	12,750	5	$\frac{1}{2}$	$17\frac{1}{2}$
2. Single nuts	12,500	6	$\frac{3}{8}$	25
3. Peas	12,250	6	$\frac{1}{4}$	25
E. Bituminous Derbyshire and Nottinghamshire Dry Screened Coals.				
1. Double nuts	12,250	9	$\frac{1}{2}$	15
2. Double screened small nuts	12,000	9	$\frac{3}{8}$	20
3. Pea nuts	11,500	10	$\frac{1}{4}$	20
F. Bituminous Leicester-Warwick and South Staffordshire Dry Screened Coals.				
1. Double nuts	12,000	10	$\frac{1}{2}$	15
2. Double screened small nuts	11,750	10	$\frac{3}{8}$	20
3. Pea nuts	11,250	12	$\frac{1}{4}$	20

British thermal units shall be ascertained on coal dried at 220 deg. F. for an hour by means of a Mahler bomb calorimeter.

Moisture shall be represented by the total loss in weight of the coal as delivered after air drying and exposing to a temperature of 220 deg. F. for one hour.

The percentage of sulphur shall be based on the analysis of the coal "as received," and must not exceed 2 per cent.

The sieves used for determining the percentage of "small" shall be of square mesh, with openings in the clear to the sizes given.

It will be noticed that the table gives no figures for ash, this factor being sufficiently covered, it is considered, by the calorific value. This is entirely contrary to the practice here, and is not, we consider, in the right direction; it would be better to use the ash basis and leave out the B.t.u. value.

It is true that increase or decrease in the B.t.u. value generally means lower or higher ash percentage, when applied to the same kind of coal, but there are other points in which ash is a factor besides the mere heating value.

ITALIAN STATE RAILWAYS (Extracts From Specifications)

Origin of Coal—The coal to be obtained from good seams in the district of

The origin of the coal must be guaranteed during the whole contract by certificates from the mines and other documents that the railroad administration requires.

The administration reserves the right to ascertain the origin at the mine by its own agent, to whom the shipper must give all the proofs necessary.

Quality of Coal—Large coal should be divided from the slate or other foreign materials, and should be of such a quality suitable for special use in locomotives.

In order to ascertain this, the coal will be tried on the locomotives and should be capable of producing abundant steam. After combustion, the ash should not obstruct or cling to the grate bars.

In case it should be found that the coal does not correspond exactly to the foregoing conditions, the administration of the railroads will have the right to cancel further shipment from the mine supplying such unapproved coal.

The large coal should not contain more than 20 per cent. of small when unloading it in the harbor of the purchaser. The administration, in order to ascertain the percentage, will screen the coal when unloading from the ship. The percentage of small will be ascertained on the ground while passing the coal slowly and in small quantities over a screen of the dimensions of 2 by 1 m. with the bars 12 mm. apart and placed in an inclined position of 45 deg.

The test by screening will take a quantity of the coal corresponding to about 2 per cent. of the unloading. Should the consignment be unloaded in different ways, namely, directly from the ship to cars on the wharf, or into barges, the quantity used for the screening test will be taken proportionately from each of the different ways of discharging.

For the coal that is directly taken from the ship to the cars, one sample for test will be taken from one carload per day. For the coal that is taken directly from the ship to the wharf, there will be taken at the time of unloading, a number of baskets of coal, and this coal will form a small heap which will be screened and the percentage obtained. For the coal that is loaded into barges, a certain number of baskets will be taken as above.

Finally, upon the unloading of the steamer, there will be determined the mean percentage of smalls contained in the whole shipment. This report will be made from the coal directly unloaded from the ship. The quantity of smalls exceeding their allowances as above will be considered as small and paid \$1.44 per ton less than the price agreed upon.

The railroad company reserves the right to change the full consignments of the coal whenever the coal should show excessive friability.

Heat Units—The mean heat power of the large coal will be 7750 calories and will be determined by the Thompson calorimeter. In case of decrease of calories, there will be for every English ton a penalty of 0.1c. ($\frac{5}{1000}$ th) for every missing calorie.

Ashes—The mean ash from large coal should not exceed 5 per cent.; in case of an excess, the penalty of 8c. ($\frac{10}{1000}$ ths) will be charged for each English ton, and for the hundredth unit, the fraction of the unit will be considered proportionately.

Sulphur—The quantity of sulphur should not exceed 1.10 per cent.; in case of excess, the company will have the right of changing the origin of the coal.

Volatile Matter—The volatile matter will range between the minimum limit of 14 per cent. to the maximum of 25 per cent., deducting the humidity.

Humidity—Coal should not contain more than 0.9 per cent. of water of composition. The administration will have the right to carry out the conditions of this clause pertaining to the samples. In each taking, they will choose a sample from one or more baskets taken from each pile, in equal quantities from the small and large, and these should weigh about 20 kilos. This coal will be passed into receptacles of thin metal, and after mixing, a sample will be taken therefrom and passed into a glass receptacle with a stopper polished and paraffined, with the date of taking, and will be forwarded to the chemical laboratory of the administration and tested at a temperature of 100 deg. C.

The means of the results obtained from the samples taken every day will give the humidity, and if this should be greater than 0.9 per cent., the difference will be applied to the quantity of the unloaded coal on the day to which the test refers, allowing for the smaller weight.

Determination of Calories, Ash, Sulphur and Volatile Matter—For the determination of the requirements mentioned in Article 4, there will be taken from every vessel at the port of unloading, 10 samples of coal 10 kilos in weight, each to be taken at an equal interval during the unloading.

Each of these samples will be taken from the barges or from the wharf, according to the manner of unloading, and

should be taken from the small coal. Every sample will be placed in a bag, with the seal of the administration, and have a tag indicating the number of the contract, the name of the boat, date of delivery and the firm of the agents of the shippers. The sample will remain in the custody of the administration.

After the verification of the seals at the laboratory, the 10 samples will be opened and the coal contained in them will be collected together and ground well and mixed in such a manner as to form a homogeneous mass. From this will be taken 1.50 kilos of coal, which, after having been ground again and mixed, will be divided into three equal parts in such a manner as to form three samples of $\frac{1}{2}$ kilo each. These samples will be sealed and labeled and two will be retained by the chemical laboratory of the administration, and one will be remitted to the shipper. Of the two samples remaining in the chemical laboratory of the administration, one will serve for test and for chemical analysis and the other will be held in reserve subject to the demand of the shipper. Second analysis will only be called for in case of confirmation being required.

The consignor should assist at the making of the analysis. The results of the analysis will in no case be protested.

Penalty—The analysis will be made separately for the loading of each ship, and the following penalties will be made unless the shipment is in accordance with Article 4: (a) As regards the determination of ashes and calories; (b) As regards the humidity. To complete the shipment it will be necessary to obtain the mean results of percentage of ash and amount of calories for all samples, and this mean will be decided as regards the payment and the acceptance of the shipment.

The penalty of excess of percentage of ash and deficiency in calories will never be applied simultaneously, but only the greater of the two will be used.

STOCKHOLM ELECTRICITY WORKS, SWEDEN (Extracts From Specification)

Coal supplied under this proposal must be suitable for automatic chain-grate stokers with natural draught (Babcock & Wilcox type). The percentage of volatile matter should amount to between 28 to 35 per cent., and the percentage of ash not exceed 18 to 20 per cent. All percentages figured on the basis of dry coal.

Coal furnished under this proposal should preferably be suitable for direct use without crushing, such as rough smalls, peas or pearls, nuts or beans, etc., but proposals made on the basis of large coals will also be considered.

The proposal should contain the following data: (a) The name by which the coal offered is generally known in the market. (b) The name of the coal field and the colliery or collieries where the coals are mined. (c) The size and kind of screen over which and through which the coal has passed when screened. (d) Approximate percentage of dust and fine coal (all coal which will pass through a $\frac{1}{8}$ -in. hole). (e) The percentage of volatile matters in the dry coal (complete analysis should if possible be submitted). (f) Character of the clinkers formed by the combustion of the coals. (g) Approximate weight of the coal per cubic centimeter.

If the actual heating value of the coal delivered should differ from the established standard, the price per ton will be altered in direct proportion to the difference in heating value. For all coal which, by analysis, contains less ash than the standard established in the tender, a premium of halfpenny per ton for each whole percentage less ash will be paid. An increase in the ash content of 2 per cent. over the standard established by the contractor will be tolerated without exacting a penalty. When such excess exceeds 2 per cent. above the standard, deductions will be made from the price paid per ton in accordance with the following table.

(Note—This ash table is the same as used by the U. S. Bureau of Mines.)

If the percentage of moisture should differ from the standard, the price per ton is altered in inverse proportion. For example, if the coal contains 2 per cent. more or less moisture than the standard, the price will be decreased 2 per cent. accordingly.

To get a fair average of the coal delivered, samples should be taken all the time the ship is unloading in order to obtain samples from all parts of the cargo. The sample taken shall not be less than 600 lb. The gross sample will be pulverized as rapidly as possible, mixed thoroughly and divided into four equal parts. Opposite quarters will be thrown out and the remaining portions thoroughly mixed and again quartered, throwing out opposite quarters as before. This process will be continued until the final sample is reduced to such amount as to be suitable for test.

This sample will be analyzed and tested (using a bomb calorimeter) by the Kungl Tekniska Hogskolans Material-prefningsanstalt (the testing department of the Royal Tech-

nical Institute in Stockholm). A copy of the result will be mailed to the contractor on the completion thereof. On this test will be based the corrections to be made on the standard price. The right is reserved to the contractor or his representative to be present and witness the sampling and preparation of the final sample. The cost of the test to be paid by the purchaser.

LONDON COUNTY COUNCIL POWER STATION (Extracts From Specification)

The specified standards are:

Calorific value	12,500 B.t.u.
Small (passing through $\frac{1}{8}$ -in. mesh sieve)	20% by measurement
Moisture	10% by weight

The calorific value and moisture are measured by the county council chemist on samples taken from every 100 tons brought over the pier head, the calorific value being determined by a Mahler bomb calorimeter on samples dried at 100 deg. C. Moisture is determined on a weighed portion of the sample taken from an air-tight tin.

Small coal is ascertained on the pier on a sample of about 50 lb. in weight, taken at the option of the council, either from the hold or from the quantity unloaded from the grabs.

If the quality of the coal in any cargo, as ascertained by the samples tested, be found different as regards calorific value, moisture or small from the above standards, the price paid to the contractor is varied as follows:

(a) If the calorific value exceeds 12,500 B.t.u., the price per ton is increased in the same percentage ratio as the increase in calorific value.

(b) If the calorific value is less than 12,500 B.t.u., the price is decreased in the same percentage ratio. The council, however, has the right to reject the whole of the cargo if the calorific value be less than 10,500 B.t.u.

(c) If the moisture is less than 10 per cent. by weight, the quantity of coal to be paid for is increased beyond the quantity weighed in by a percentage equal to the percentage decrease of moisture.

(d) If the moisture exceeds 10 per cent. by weight, the weight of coal to be paid for is decreased below the quantity weighed in by a percentage equal to the percentage increase in moisture. The council, however, has the right to reject the whole cargo if the moisture exceeds 13 per cent.

(e) If the proportion of small be less than 20 per cent. by weight, the weight of coal to be paid for is increased beyond the quantity actually weighed in by a percentage equal to a quarter of the percentage decrease of small coal.

(f) If the proportion of small coal exceeds 20 per cent. by weight, the weight of coal to be paid for is decreased below the quantity actually weighed in by a percentage equal to a quarter of the percentage increase of small coal. The council, however, has the right to reject the whole cargo if the proportion of small coal exceeds 25 per cent. by weight.

As a general conclusion, it is believed by many chemists, engineers and others, that after the buyer of steam coal has decided on the description of coal he desires and what is best adapted to his use, there are only two items necessary, as regards analysis, in making up specifications, that is, the percentage of ash and the fusing temperature of the ash.

A standard percentage of ash of a given kind of coal (field or seam) insures a standard B.t.u. value; any change in ash percentage makes a corresponding change in B.t.u. value. The right ash-fusing temperature means no clinkers and good combustion results, if the coal is handled properly.

Where smoke laws are to be observed, it may be necessary to specify also a maximum volatile content of the coal, although even here it would generally be advisable and economical in the end to alter furnace and boiler conditions, so that higher volatile, cheaper (usually) coals could be used.

Simplicity, equity and practicability, should be the characteristics of all specifications, for the purchase of coals.

Never neglect for a moment the early signs of a fire in the underground workings of a mine. Either deal with it yourself immediately, or report it straight away to your superior.

An Analysis of the Coal-Car Situation

COMPILED BY A. T. SHURICK

SYNOPSIS—In conformance with our past custom we present herewith a brief summary of the car-supply outlook for the coming winter. With the kind assistance and hearty coöperation of many of the leading railroad officials we are fortunate in being able to give an accurate and concise review of the actual physical condition of the leading coal roads. The current outlook is notably more favorable than usual but still replete with grave latent possibilities, due to the generally weakened financial condition of the transportation companies.

There has probably been less anxiety expressed over the possibilities of a car shortage the coming fall and winter than for a number of years. Ordinarily this season of the year occasions a great deal of concern to the operating companies. It is at this time that the consumers are reminded by occasional cold snaps, of the necessity

with the idiosyncrasies of the coal market are well aware of its liability to experience a direct reversal of form almost over night. As to the weather conditions, even with a comparatively restricted movement, it is possible for the situation to be so adverse in this respect as to prove a serious factor.

There is also this further consideration, the great importance of which must be conceded by all, and that is, the exceedingly weakened financial condition of the railroads. While the publicity campaign conducted by the railroads, in their attempt to secure a general horizontal advance in freight rates, no doubt somewhat exaggerated conditions in this respect, it is obvious, from a perusal of their various financial statements that new construction, repairs and maintenance have all been curtailed to an irreducible minimum. It is inevitable, therefore, that the actual physical condition of the railroad systems of the country is considerably below normal, and careful students of the situation are agreed that the combination of any abnormally severe weather, together with a heavy freight movement, would be accompanied with grave possibilities of a severe collapse in our transportation facilities.

THE KANAWHA & MICHIGAN RY.

(By President F. B. Sheldon.)

Since the close of the year this company has added to its motive power seven heavy consolidation freight locomotives received in July, and 1160 steel coal cars of 50 tons capacity, received in July and August, the latter adding 30 per cent. to the capacity of its coal-car equipment, which now amounts to 6000 cars.

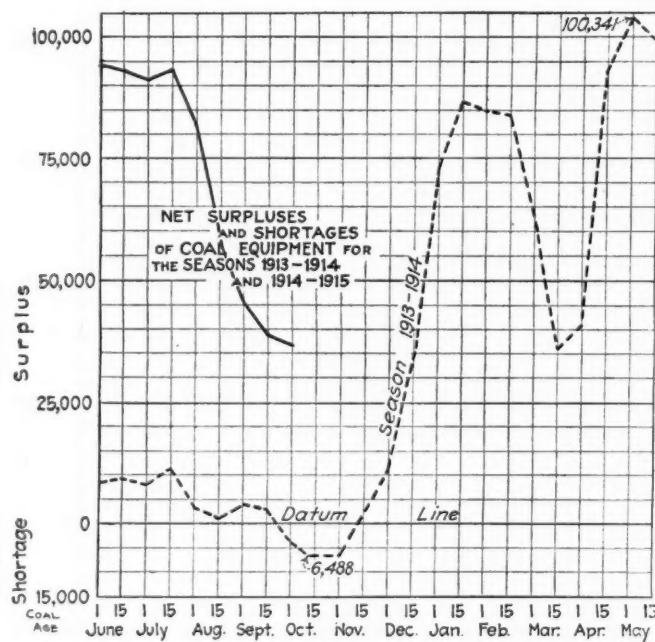
During the past year alignment and grades were changed for a distance of one mile on the Ohio Division, excessive curvature being reduced to three degrees or less, and grades in both directions entirely eliminated. Terminal yards were increased during the year by the addition of three and one-half miles of sidings, while 17 passing tracks on the West Virginia Division, involving three additional miles of track, were lengthened to the standard of 4000 ft. to accommodate longer freight trains. Some 19 miles of main track were relaid with 90-lb. steel rail, and the entire length of the main track between the northern terminus at Corning, Ohio, and the southern terminus at Gauley Bridge, W. Va., is now laid with rails of that weight. The road and its equipment are in excellent condition for the winter, and the recent large increase in its coal-carrying equipment assures a good car supply.

THE HOCKING VALLEY RY.

(By Vice-President M. J. Caples.)

During the past summer the Hocking Valley Ry. has completed and put into use a modern coal-handling plant on the east side of the Maumee River at Toledo, Ohio. This plant is capable of loading aboard vessels at least 160,000 tons of coal per day of 24 hr., when worked to full capacity.

During the summer just past, the road has received 1000 additional 57½-ton coal cars. Our coal-car capac-



CURVES SHOW FLUCTUATIONS IN THE CAR SUPPLY

of laying in their winter stocks, while at the same time, the resources of the railroads are being strained to the limit handling the crops; in addition, the situation is often further aggravated by more or less inclement weather which seriously interrupts the running schedules.

Because of the generally depressed conditions throughout the country, the freight movement on the railroads has seldom been lighter, and the different systems are expressing every confidence in their ability to handle the situation this year without any trouble whatever. On the other hand, all must agree that there are still certain unknown factors in the problem, viz., the extent of the demand and the weather. If the current market conditions may be taken as any criterion of the outlook for the winter, it is manifest that the demand for coal is not liable to be of sufficient proportions to seriously burden the railroads, but on the other hand those familiar

ity at the present time is 516,450 tons, compared with 417,020 tons at this time last year. The tractive power of locomotives now is 4,938,920 lb. as compared with 4,574,120 lb. last year.

The Hocking Valley, with its present trackage facilities, can handle 50 per cent. more business south of Columbus than it handled last year and 25 per cent. more business north of Columbus. There is no probability but that we will not be able to supply all of the coal cars required and handle all of the business offered us promptly.

THE CHESAPEAKE & OHIO RY.

(By E. P. Goodwin, Superintendent Transportation.)

The consensus of opinion, as far as I have been able to learn, is equally balanced as to prospective increase or decrease of coal loading, under the conditions brought about by the European war. The C. & O. Ry. has just gone through four months of the heaviest loading in its history, and I personally feel that the demand for coal will be good, and anticipate that our car supply will be adequate to meet it.

The road has increased its coal-car equipment 15.34 per cent. in the past year, and has greatly added to its freight power by the acquisition of new Mallet and Mado engines; it has also improved transportation facilities generally, especially by the completion of the most modern up-to-date electric coal docks at tidewater. These improvements will permit of an increased "miles per car per day" that would, under pressure, equal another 15 per cent. increase in car equipment.

NORFOLK & WESTERN RY. CO.

(By D. E. Spangler, Superintendent Transportation.)

In a statistical way there is little that could be added to the statement we furnished you, 1913, other than to bring those figures up to date, which I do as follows: Number freight engines, 970; tractive power, 40,200,000 lb.; number of coal cars, 34,253; total carrying capacity, 1,733,958 tons. We have also added 46 miles of second track and 79 miles of passing tracks.

While future needs of the trade are entirely problematical, this company is confident of its ability to promptly meet the demands of all mines on its lines during the coming winter. Our facilities, both as to equipment and track, have been increased and improved. Other improvements, such as second track, are still in progress and we should be in position to handle expeditiously, as far as our own rails are concerned, all traffic that may be offered in the near future. However, as much of the coal mined on the Norfolk & Western Ry. is disposed of to markets far beyond this line, we are dependent to a considerable extent upon the prompt release of equipment at destination and the prompt and proper handling of both the loaded and empty cars by our connecting lines.

THE WESTERN MARYLAND RY.

(By S. Ennes, General Superintendent.)

In March and April of the current year, the Western Maryland received and added to their motive power equipment 20 of the largest type of consolidation freight engines. These are giving us the very best of service, handling during the good weather of July and August 6500 train-tons against a 0.3 per cent. grade line from Cumberland to Hagerstown.

When the new management took hold in March of this year, they immediately sent 40 locomotives to the American Locomotive Works for overhauling. At the present time, with our business equal to that of last year, we have 25 heavy freight locomotives white-leaded, and available for service at any time.

We also took advantage of the dull season to put our cars in first-class shape, and are prepared to handle an increase of 25 per cent. in our coal business with ease. The bridges between Hagerstown and Lurgan and Cumberland and Thomas have been strengthened, so that heavier power can be run in that territory. The track is being put in good shape and as stated, with business approximately the same as last year, we are handling it with ease.

NEW YORK CENTRAL & HUDSON RIVER R.R.

(By Vice-President A. T. Hardin.)

This company has maintained its quota of last year's equipment, which was more than abundant, since all orders were promptly filled. We also have 150 excellent freight engines in reserve for emergencies, and not now being used. We are not, therefore, anticipating any difficulty in the coal-car supply on our lines.

BALTIMORE & OHIO R.R.

(By J. Hampton Baumgartner.)

Although there was a substantial increase of 475,000 tons in our coal traffic during the last year, this was handled with greater dispatch than ever before and without any material extension of terminal or traffic facilities; this is due to the fact that the road for the first time derived the full benefit of the enlarged facilities provided during recent years at a cost in excess of \$100,000,000. The recent inactivity in the building of new

THE CAR SITUATION

American Ry. Association reports surpluses and shortages of coal equipment for two weeks ended Oct. 1, as follows:

	Surplus	Shortage	Net*
New England Lines.....	1,007	216	791
N. Y.; New Jersey, Del.; Maryland; Eastern Penn. . .	4,102	0	4,102
Ohio; Indiana; Michigan; Western Pennsylvania . . .	17,009	0	17,009
West Virginia; Virginia, North & South Carolina . .	4,534	185	4,349
Kentucky, Tenn.; Miss.; Alabama, Georgia, Florida .	3,763	0	3,763
Iowa, Illinois, Wis., Minn.; North & South Dakota .	3,257	30	3,227
Montana, Wyoming, Nebraska.....	564	0	564
Kansas, Colorado, Missouri, Arkansas, Oklahoma . .	1,544	260	1,284
Texas, Louisiana, New Mexico.....	212	5	207
Oregon, Idaho, California, Arizona.....	2,004	76	1,928
Canadian Lines.....	0	0	0
Total.....	37,996	772	37,224
June 1	94,770	93,520	91,280
June 15	93,520	91,280	93,509
July 1	91,280	82,284	56,560
July 15	82,284	56,560	46,141
Aug. 1	56,560	46,141	39,558
Aug. 15	46,141	39,558	66
Sept. 1	39,558	66	191
Sept. 15	66	191	
Surplus.....	99,351	94,763	90,850
Shortage.....	94,763	90,850	93,217
Net*.....	90,850	93,217	82,174
	82,174	56,064	46,075
	46,075	39,367	

*Bold face type indicates a surplus.

facilities was due to financial circumstances, which made it inadvisable to extend facilities beyond the point of urgent necessity.

During the past year this road has added 50 locomotives of the freight type, 3000 new coal cars and 3000 rebuilt cars to its equipment quota, so that at the present time the road has ample coal-car equipment to take care of its traffic requirements.

Included in the plan of extending facilities to increase the number of tracks, was a double-track stretch of line between Orleans Road and Little Cacapon, W. Va., a distance of 11 miles, known as the Magnolia cutoff, which will facilitate the movement on the east end of the Cumberland division. The improvement, which will cost about \$6,000,000 and is well under way, will carry toward completion the plan to build a four-track line from Cumberland

to Brunswick, Md., a distance of 105 miles, and then with the completion of four tracks to Washington Junction there will be a four-track line throughout to the seaboard at Baltimore.

The Magnolia cutoff is in every sense an economic improvement. Besides shortening the distance between these two points via the present line by 5.8 miles, it will effect an elimination of 887 deg. of curvature and do away with a helper grade at Hansrote, which has required the use of an extra engine on eastbound freight trains—the direction in which coal moves—in climbing the mountains.

It is generally recognized by railroad managers of the present day that their properties are never regarded as finished plants, the necessity of adding to them to take care of changes in traffic and business conditions being ever apparent. With this particular road, however, the problem before the management today is one of intensive operation, as there is little undeveloped territory in which lines may be extended.

ILLINOIS CENTRAL R.R.

According to the sixty-fourth annual report of this company, issued under date of June 30, the freight-car equipment was increased by 7195 cars and 4065 cars were sold, destroyed or transferred to other service. The net increase was 3130 cars. The average capacity of cars owned at the close of the year was 41.52 tons, compared with 40.24 tons last year. The total capacity of cars was 2,467,995 tons, compared with 2,266,490 tons for 1913.

At the end of the fiscal year 1914 the company had 26,285 coal cars, compared with 23,330 cars for the year previous. This shows an increase of 2955 in the coal-car equipment.

The record of the revenue coal freight for 1914, as compared with 1913, is as follows:

	1914		1913	
	Tons	P.C.	Tons	P.C.
Anthracite	68,450	0.21	90,659	0.30
Bituminous	12,145,945	37.55	10,488,614	34.45
Coke	126,028	0.39	127,680	0.42
Total	12,340,423	38.15	10,706,953	35.17

This shows a net increase of 1,633,470 tons, or 2.98 per cent.

Extracts from a Superintendent's Diary

I have long been of the opinion that the biggest problem now ahead of the men responsible for the future of the coal industry is to succeed in devising ways and means of attracting the boys born and reared in mining camps to coal mining as a life work.

In the old days when miners' sons were given little or no schooling, and were taken into the mines by their fathers as soon as they were able to be of any assistance, most of them graduated into mining from force of habit and only on rare occasions did they have any desire to make a change. But all of that is changed now. In most states, boys are not allowed to work underground until they have passed the age of 14 and in some states the limit is 16. In place of the old indifference to schools, compulsory education is now sweeping the land, and even in the most isolated camps, school bells are not only heard but are respected. Habit will have little weight in the future in shaping a boy's life work, but

the decision will be largely dependent on sentiment and imagination.

It is true that when it comes to sentiment, home ties and boyhood friendships are strong invisible links holding the would-be wanderer in line, but it takes something stronger than sentiment to hold a boy back if his imagination is once fired by an outside vision.

And what's to prevent any boy from having his imagination fired by visions these days? Just let him follow the dailies awhile and he'll get all the inspiration he's looking for; furthermore, if he is a normal chap, you may be sure he'll believe he can do anything that anyone else has ever succeeded in doing, and he won't hesitate to try.

When he gets his thoughts back to earth and recalls a vision of tumbled down, unsightly, unsanitary dwellings (one of which is his own home) it doesn't take him long to make up his mind. And then, to complete the impression, if he walks down the street and overhears a conversation between a fireboss and an assistant mine foreman as to the impossibility of either one of them keeping the wolf from the door on the salary they are earning, despite the fact that they had to put in two hard years of night study to get where they are—well he's ready to leave and leave quick.

The way the wind might blow was first brought home to me when I began to take an interest in "First-aid work." After our squad had succeeded in getting a little training, a small local gas explosion gave them an opportunity to don the helmets. The next day the youngsters of the camp were all excitement; at last they had something worth while to talk about and, for the time being, they lost all interest in base ball and flying machines and talked about some sure-enough heroes who were living right there in their home town.

And if those same boys in future years, in looking backward, should always recall a pleasant home and neighbor boys, whose fathers were bosses, proud of their work and of their profession, the chances are they will be found earning their livelihood in places where helmets are still in demand on certain occasions.

Sometimes I become much vexed with my big boss when he tries to shut down too closely on my sociological tendencies, as he calls them. In fact, I feel that way toward him just now and I'm putting this justification down in black and white just to get in practice.

Permissible Explosives in Coal Mines

The figures show that in 1902 only 11,300 lb. of permissible explosives were used in coal mining, whereas in 1913 the quantity so used was 21,804,285 lb. The quantity of permissible explosives used in the United States is larger than in a number of foreign countries. In 1912 it represented about five per cent. of the total quantity of explosives produced, and in 1913 six per cent. The total amount of explosives used for the production of coal in 1913 was 209,352,938 lb., of which about ten per cent. was of the permissible class as compared with eight per cent. in 1912. The use of permissible explosives in coal mining has had gratifying results, and few, if any, serious accidents can be attributed directly to their use.

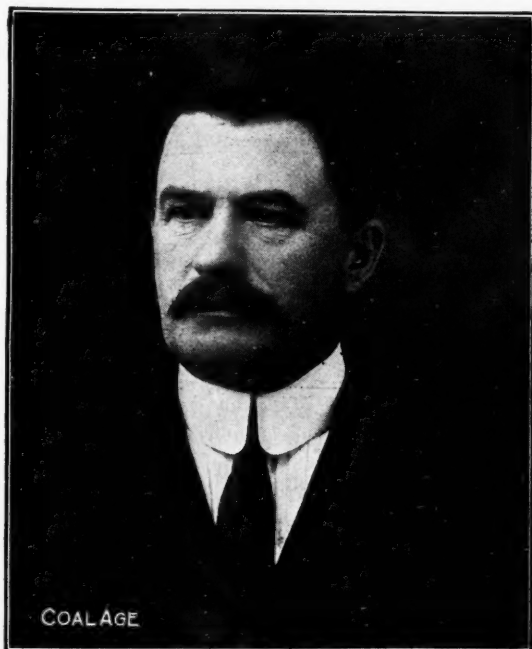
Who's Who in Coal Mining

John Francis Healy

Starting at 10 years of age, doing odd jobs on a mine-surveying corps, and working up to the position of vice-president of a large coal consolidation is the record of J. F. Healy, who is now engaged in mining in Utah.

Mr. Healy was born in Blossburg, Penn., of Irish parents. His early education was received in the common schools of Tioga County, after which he attended the preparatory school of De La Salle College and then the Toronto School of Practical Science in Toronto, Can. His final college training was received at the Pennsylvania State College, where he graduated in 1884.

As stated above, Mr. Healy first became engaged in mining work when only a lad of 10, and continued in this



JOHN F. HEALY

line of employment, off and on, until he was 18. His first serious work after concluding his college course was as engineer in the employ of the Aberdeen, Pierre and Fergus Falls Railway—now a division of the Great Northern. His next place was division engineer with the Nashville & Knoxville Ry.—now the Tennessee Central, after which he entered the employ of the C., N., O. & T. P. Ry. as assistant engineer of maintenance.

This ended his railroad experience, for he accepted a position as mining engineer with the Seattle Coal & Iron Co., Seattle, Wash. He was next identified with the Rocky Fork Coal Co., in Montana, and followed this work by accepting a position as mining engineer with the Davis Coal & Coke Co., in West Virginia. A little later, when the Davis company needed a man to fill the job of general superintendent, Mr. Healy was offered the place, which he accepted and filled to the satisfaction of all. His success with the Davis company led to his next advancement to the position of general manager of the Davis Colliery Co., one of the largest mining corporations in northern West Virginia.

Leaving the Eastern field, Mr. Healy now turned his attention to the Far West, finally locating in Utah, where he is now serving as vice-president and general manager of the Consolidated Fuel Co., Blackhawk Coal Co., Panther Coal Co., Castle Valley Coal Co., Carbon-Emery Stores Co., and Carbon Purchasing Co.

Mr. Healy is a member of the American Society of Civil Engineers, and has taken an active interest in the advancement of mining and civil engineering practice in America. His literary work has been confined to the preparation of a pamphlet entitled, "The American Language." This pamphlet, as Mr. Healy says, "is merely an effort to help Americanize America."

Relation of Observed to Calculated Pressures in Gas Explosions

Attention has often been drawn to the difference between the theoretical pressure of an explosion of gas mixed with air, as calculated from the heats of combustion of the several gases involved; and the actual pressure observed experimentally in the explosion. In this connection, a paper on "The Lost Pressure in Gaseous Explosions," by W. M. Thornton, is of great interest.

In his paper, Prof. Thornton draws attention to the fact that the theoretical or calculated pressures of gas explosions are, in all cases, about twice the pressures observed in the experimental explosion of the gas. From the results of a large number of experiments, he has ascertained the interesting fact that the mean of the ratios of the observed to the theoretical or calculated pressures of gases exploded in air is about one-half.

As is quite well known, the cause of the difference between the theoretical and the observed pressures in gaseous explosions, has been variously attributed to the lack of knowledge of the actual reactions that take place in the dissociation of the elements of the gases and of the products formed. It has, also, been assumed with reason that the specific heats of gases are much higher at the temperature of the explosion than the values determined by experiment. It has been further suggested that there is much loss of heat by radiation and conduction, which has not been accounted and cannot be estimated with any degree of accuracy. A less obvious reason has been suggested to the effect that the maximum pressure of the explosion may be developed before the combustion is complete.

Without casting any reflection on these suggested influences, any or all of which may operate to a degree to reduce the experimental value, Prof. Thornton makes the important suggestion, as drawn from his experiments, that the force of cohesion developed in the formation of the molecule may explain the absorption of a portion of the heat energy of the reaction. He ascribes the pressure and temperature developed in an explosion to what he terms, "translational energy," or the energy imparted from one molecule to another; and reaches the conclusion that the ratio of translational energy of two colliding bodies before and after collision is one-half the total energy developed. The theory, though necessarily incomplete, is suggestive and may prove helpful in the solution of the many problems relating to the explosions of gaseous mixtures.

Editorials

Safety Hints

Several of the railroads are adopting a system whereby they expect to increase the safety of passengers and employees. They supply post cards at each terminal or yard office which their men can obtain and use for the purpose of calling attention to the operating departments of any dangers they may observe in their daily work.

Each of the roads has a standing committee, of which the head officer is chairman. At each divisional headquarters there is a committee, composed of members from each department. The superintendent of the division is the local chairman and he selects the others, who are appointed for a year.

The committees meet monthly and every department is represented. Thus motive power, transportation, signaling and maintenance of way are all duly considered by employees from those several departments.

The post cards filled by the employees are all read by the assembled committee and their value duly considered. They are then printed with comment, each employee being duly credited with the suggestions made. Should, however, the recommendations of the employee be such as to need urgent action, the superintendent accepts the suggestion without delay and wires appropriate orders. For this information we are indebted to E. E. Winters, the chief railroad inspector for the West Virginia Public Service Commission.

We believe that a similar system to that just described could be put in operation at mines. Perhaps a few malicious criticisms might redden the cheeks and ruffle the temper of the superintendent, but, on the whole, it is to be expected that the suggestions would be just and valuable. Some companies, like the H. C. Frick Coke Co., have formed paid safety committees to make reports on mining conditions and are convinced that the experiment makes for safety. The post-card system gives a less limited range for suggestion and might be well worthy of trial.

Much depends on the character of the personnel at the mine as to the success of the movement. In some cases such a system of suggesting dangers to employees would be as fatal as the inquiries of a doctor are to a hypochondriac, who is no sooner asked as to his symptoms than he overwhelms his hearer with a combination of woes no single man ever yet endured.

We recall a coal-company president who took his private car down to the mines and considerably invited the Italian consul to go with him, treating him with consideration of the most distinguished sort. He impressed on the consul throughout the journey, his humanitarian interest in his Italian employees and requested the consul to ask his compatriots at the mine what could be done to increase their safety and comfort.

The consul did so, and the swarthy sons of Italy believed that the strong, omnipresent hand of "*il gran re Umberto*" was behind the consul and their demands for increased wages thereupon resulting blossomed into a

strike of no small dimensions. The president lost his interest in the consul and in purposes humanitarian and never again was known to ask for suggestions from that source.

The general attitude of the employees must decide whether the post-card or the committee system will either or both be feasible. It is a piece of socialism and can only be a success when the men have the social sense strongly developed and realize that in this world of ours no finality of safety or comfort can ever be reached and that the burden of safety falls equally on the shoulders of employers and employees.

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Profits or Thrift?

Speaking before the Coal Mining Institute of America at the winter meeting nearly a year ago, Harrington Emerson, the efficiency expert, declared that the steamship *Mauretania* cost roughly nine million dollars, and employed a thousand men. Thus an outlay of nine thousand dollars was needed to supply the wherewithal by which each man on that ship could earn his living. Of course, some operatives are not backed by such an outlay of capital to furnish them with opportunity of efficient labor. Their work would be more serviceable to mankind if they were.

But a careful consideration will lead us to the conclusion that the instance quoted by Mr. Emerson is uncommon in degree rather than in kind, for many mining plants expend more than two thousand dollars for every man they expect to employ. It is clear therefore that large amounts of capital must always be provided, and without pretending to scientific accuracy or a really adequate consideration, we might be excused in saying that the average capital back of a workingman's labor is roughly equal to his year's gross earnings.

There is no reason why the funds needed to supply the workman with tools should be owned by rich men. If the wage of the laborer is not all spent, but if some of it is preserved by thrift, he can invest it and become himself the capitalist. If, however, the workingman, like the average American, raises his scale of living as fast as his wages, the only hope for the citizens of this country is in large profits for the manufacturer and operator. If the workingman will not save, his employer must do it for him or the material for economic production will not be accumulated.

It is in fact necessary that there should be for the future of the workingman, either large profits or universal thrift. Of course, such penuriousness on the part of the workman as decreases his efficiency, by lowering his physical, mental, and even moral status is not thrift. But such economy as makes him a purchaser of only healthful, advantageous and permanent possessions will enable him to enter into the field of the capitalist with benefit to the world at large.

The amount of capital being increased, profits would be lowered and the workingman would get a larger share

of his product in wages. It is sometimes said that profits are necessary to urge capital to invest, and to encourage thrift, but it is even more true that profits or thrift are needed because without them capital could not even exist and labor would be deprived of its tools.

From what has been said, it is clear that the efficient operation of mines demands profits. A starved executive is as inefficient as a hungry laborer. The one has not the equipment for economic operation; the other has not the diet to vitalize his labor.

Let us hope, however, that the time may come here, as it has, perhaps, only come in one country, France, up to the present, where thrift may make profits less necessary to the good fortune of the commonwealth. If every man were to own his own home the result would be a liberation of capital for industry, a boom the like of which this country has never before seen. As it is now, with so much of the wages of the workingman being wastefully spent on ephemeral benefits or even in permanent self-injury, the growth of capital is slow and is most largely provided by what is termed the "greed of capital for profits." The thrift of the masses would be a far preferable basis on which to rear our economic future.

One of the great sources of Germany's rapid rise, as also of the rapid progress of the iron and steel industries in this country, has been the large profits made by reason of the tariffs in both countries and as a result of restrictive syndicates in the case of the German Empire. We cannot feel satisfied that individuals should be enriched at the expense of their employees, but at the same time that the results of large profits are not wholly undesirable is seen in the excellence of the welfare work and of the scientific experimental investigation which in Germany, America and England, have followed wherever profits have been large.

As the world progresses, it is to be hoped that the thrift of the worker will oust the profits of the employer as a source of that accumulated capital which means so much for humanity.

The Daily Press and the Colorado Situation

The presumptuous intrusion of the daily papers into the intricate technical problems of the coal industry has long been a source of distress to the mining fraternity. The editorial and space writers of the big metropolitan dailies criticize coal men whenever and wherever the opportunity is afforded them.

In this day of the highly developed super-specialist, the conclusions of such versatile pen artists must be viewed with suspicion. These writers, whose knowledge of the many different issues upon which they pass is of the most superficial character, do not hesitate to pass judgment upon men who have made each of these problems a life study; men who frequently are trained scientists, and whose fathers before them often have lived and died in the service in which they are engaged.

An insidious editorial of this character appeared in the *New York Sunday Times* of Oct. 18, under the caption "Which Union for Colorado." It is written as a reply to a well meaning attempt on the part of President Welborn of the Colorado Fuel & Iron Co., to point out certain inaccuracies in a corrective plan suggested

in a previous editorial on this subject in the same sheet.

A seeming justification of their original policy is worked out by a clever evasion of the point at issue, and placing unspoken words in Mr. Welborn's mouth, while an obvious lack of first-hand knowledge pertaining to actual labor conditions in the mining regions of the West, is manifest throughout.

The leading argument is based upon the unfair "inference" that the Colorado operators are opposed to organized labor in any form. It has been repeatedly pointed out that this is not the situation at all in Colorado, and it is surprising to find such a well informed paper as the *Times* playing upon the credulity of its readers in such a manner.

It further contends that the Colorado operators must accept some form of unionism, in proof of which it has much to say regarding the garment and waist makers' strike in New York. It points to the fact that when these workers were finally organized, "the I. W. W. was powerless to make inroads upon the shops," and the further statement, "President Welborn and the other operators of Colorado might do well to consider the complete unionizing of their mines on this basis, if only as a measure of defense against invasion by organizers whose principles and methods they do not approve."

If this is the case, we would like to have the *Times* explain the complete disintegration of the Butte (Mont.) Miners' Union through the confessed machinations of the I. W. W. element. The Butte Union was the most powerful organization of its kind in the world, so much stronger than any of the Eastern sweatshop unions that there was no comparison between the two; and yet almost overnight, the I. W. W. precipitated such a riot that the National guard was compelled to almost take the town by assault, planting their machine-guns in the main thoroughfares, while the National Government at Washington rushed a reserve detachment of regulars to Helena, a few miles away.

While we are not in any way opponents of organized labor, it being generally conceded by all enlightened thinkers of today that legitimate unionism possesses certain advantages for all concerned, it is yet to be proved that mining operations cannot be satisfactorily conducted in any other manner. The fallacy of such a conclusion has been conclusively disproved by a number of large concerns, notably the Berwind-White Co. The Berwind interests have developed into one of the very largest coal producers in the United States, and it is a well known fact that they will not permit unionism or organization in any form at their operations, and yet there are but few mining companies in this country where the owners have experienced less labor trouble or where the working men enjoy such unexcelled advantages of all kinds.

There is no disputing the fact that for use in the smaller types of battleships liquid fuel possesses an immense advantage: (1) In simplifying ship design; (2) in affording ability to obtain and maintain great speeds; (3) in providing a far wider range of action, and (4) in diminishing the numbers and strain upon the personnel. Another great advantage is the ease with which oil-burning ships may be refilled at sea. Oil can be fed easily from one vessel to another without returning to port, and this adds an appreciable percentage to the relative fighting strength of the navy.

Sociological Department

The Utah Annual First-Aid Meet

By OTTO HERRES, JR.*

The Utah annual first-aid contest was held at Price, Carbon County, Utah, on Saturday, Sept. 26, under the auspices of the Carbon-Emery Fair Association, with the active co-operation of the important coal-mining companies of the state. This was not only the first state-wide contest ever con-

ducted in Utah; but it was also the first intercompany meet to be held in the state.

Thirteen teams were entered, each representing the best of their respective mines. The contesting teams represented the Consolidated Fuel Co., the Castle Valley Coal Co., the Black Hawk Coal Co., the Independent Coal & Coke Co., the Spring Canyon Coal Co., the Standard Coal Co., and the Utah Fuel Co.

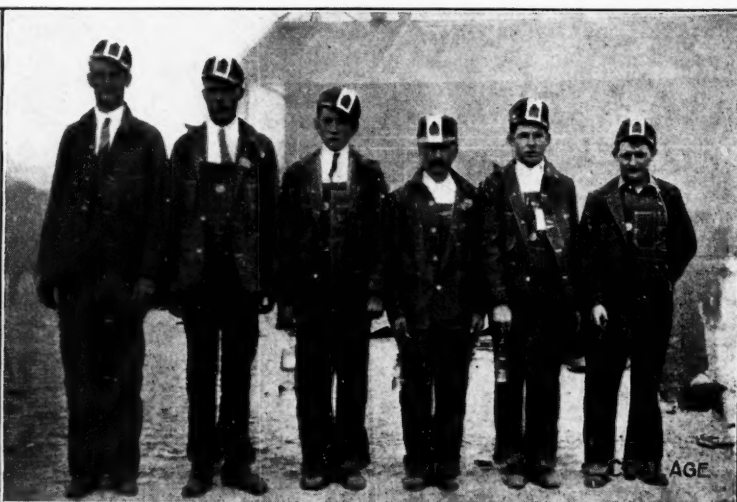
Excursion trains were run from the closer districts, and notwithstanding the difficulties of mountain travel, each team had a large following. About 1500 visitors from the mining

camp were in attendance during the entire time of the contests, remaining on the field or in the grandstand until the final tie had been decided. A large percentage of the leading coal-mining officials of Utah were present, and each one of them followed the various events with more than ordinary interest, on account of the general excellence of the work and closeness of results.

The field for the contests was laid out on the Price baseball diamond and race track, in a rather unique manner. Two rows of 12-ft. squares were outlined with white paint in the



CASTLE GATE MINE NO. 2, THE WINNING TEAM



SPRING CANYON COAL CO. TEAM WINS SECOND PRIZE

shape of a "V." The wide end of the "V" opened and was close to the grandstand so as to permit the spectators to view the work of every team. The ground was roped off, and the numbers of the various teams were suspended from the ropes in the rear of the square where each team worked. No one was permitted within the ropes except contestants and presiding officials. All announcements to the contestants and spectators were made through megaphones. Positions on the field were drawn by lot by the captains of the various teams.

The judgment of events was in charge of representatives of the United States Bureau of Mines, assisted by State Coal Mine Inspector J. E. Pettit and Dr. F. R. Slopanskey. No surgeon or official connected with the companies competing was

*Mining engineer, Castle Gate, Utah.



TEAM FROM STANDARD MINE WHICH TIED FOR FIRST PLACE IN THE TWO-MAN EVENT, AND SECURED SECOND PLACE IN THE THREE-MAN EVENT



TEAMS AND JUDGES WORKING ON FULL-TEAM EVENT—COMPOUND FRACTURE, LEFT HIP; DISLOCATED RIGHT HIP; SIMPLE FRACTURE, RIGHT FOREARM



TEAMS IN THE TWO-MAN EVENT, FACE, FOREHEAD AND EARS BADLY BURNED, BROKEN LEFT KNEECAP

allowed any part in the judging. The number of judges was such as to allot one to each two teams, and the judges were placed with different teams on successive events to eliminate the personal equation as much as possible. The judges were: J. C. Roberts, U. S. Bureau of Mines, chief judge; Dr. A. J. Lanza, U. S. Department of Health; J. E. Pettit, State coal-mine inspector; Dr. F. R. Slopanskey, Denver & Rio Grande R.R. surgeon at Helper, and J. L. Boardman, J. T. More and K. H. Chisholm, of the U. S. Bureau of Mines, First-Aid Department.

Other officers were: Marshall, Sheriff T. F. Kelter, Price; recorder, J. C. Snow, Castle Gate; timer, H. E. Lewis, Hiawatha; announcer, J. H. Hammond, Price.

Committee on arrangements consisted of Dr. E. M. Neher, Castle Gate; Dr. J. E. Dowd, Hiawatha, and Dr. Hal. Robinson, Storrs.

The contest was divided into one-man, two-man, three-man and full-team events. These were held in the morning from ten o'clock until noon. After a recess for dinner the scores on the morning's work were tabulated and the ties worked off during the afternoon.

Prizes were in cash and aggregated \$450. The first prize of \$150 was won by Castle Gate Mine No. 2 team, with a perfect score in all events. The Spring Canyon Coal Co. team won the second prize of \$75.

There were ties in the one-, two- and three-man events, and it was with difficulty that these contests were decided, as the contestants were well trained and made few errors. Bandages were applied and placed with exceptional skill and neatness. After a third problem had been given to decide the tie in the two-man event, all seven judges acting together were unable to deduct from the perfect scores of the Standard team and Sunnyside Mine No. 2 team.

The prize winners were as follows:

Grand Prize—First prize, Castle Gate Mine No. 2, \$150; second prize, Spring Canyon Coal Co. Mine, \$75.

One-Man Event—First prize, Sunnyside Mine No. 1, \$25; second prize, Sunnyside Mine No. 2, \$12.50.

Two-Man Event—First prize, tie between Standard Mine and Sunnyside Mine No. 2, \$50; second prize, Hiawatha No. 1, \$25.

Three-Man Event—First prize, tie between Mohrland No. 1 and Mohrland No. 2, \$75; second prize, tie between Kenilworth, Sunnyside No. 1 and Standard Mine, \$37.50.

The following problems were given:

One-Man Event—Patient found with cut on right temple; severe bleeding. Treat and carry 50 ft.

Two-Man Event—Face, forehead and ears badly burned, broken left kneecap. Treat and carry 50 ft.

Three-Man Event—Patient is found unconscious with face downward and lying on live wire (carrying 4000 volts), with chest severely burned. Treat and carry 50 ft.; use improvised stretcher.

Full-Team Event—Compound fracture of left thigh; severe arterial bleeding; dislocated right hip; simple fracture of the right forearm. Treat and carry 50 ft.

Problems in working off the ties were:

One-Man Event—Treat patient for crushed right foot and compound fracture of nose.

Two-Man Event—Treat a man found in blackdamp under a fall of rock, unconscious, with compound fracture of left thigh and bone projecting inward.

Three-Man Event—Treat a patient for severe burns of the hands; a deep cut of the abdomen just above the umbilicus with bowels protruding.

The rules, under which the meet was held, are identical with those in force at the Utah Fuel Co.'s meet described on p. 348 of the issue of Aug. 29, 1914, with a few changes. Thus the demerits in Rule 17 of the Utah Fuel Co. meet had in this contest this important addition: For improper treatment, five

points, and Rule 11 was changed providing that teams with the same score shall be required "to participate in another similar event" instead of in a contest between the full teams so tying.

Rule 12 being about the challenge cup was naturally omitted, and Rule 16 about the hour of contest was also changed. Two rules of interest are added, namely: Rule 18: Members of teams participating in the one-man event, two-man event and three-man event, will be barred from all other events except that for full teams. Rule 19: Every team entering this contest must procure a certificate from its respective mine superintendent to the effect that the members are regular employees of the company, and that their entrance into the contest is approved by their superintendent.

Each event was marked on the basis of 100 points for a perfect score; then divided by 5 to give 20 points for each member of the team working; and multiplied by the number of men in the event. Thus,

a perfect score for the one-man event was 20; two-man event, 40; three-man event, 60; full-team event, 100, and total score, 220 points.

The personnel and scores of the best teams follow:

Castle Gate Mine No. 2: Robert J. Henderson, captain; Jack Ramage; Jack Hreinson; Albert Wardell; James Lakin and Leonard Taylor. Score 220.

Spring Canyon Coal Co.: S. H. Short, captain; Ben Sellars; Fred Thomas; Bert Davis; John Harrison and John Haddow. Score, 216.2.

Sunnyside No. 1: Ernest Lloyd, captain; Henry Stobbs; J. W. Dunn; James Thorpe; Jack Turner; Eugene Singleton. Score, 215.2.



E. K. HOLLAND, SECOND-PRIZE WINNER IN ONE-MAN EVENT, WITH J. W. LITTLEJOHN, PATIENT

Sunnyside No. 2; J. W. Littlejohn, captain; M. H. Detwiler; J. T. Johnson; J. Patterson; E. K. Holland and Zeph Thomas. Score, 214.4.

The other teams made the following scores: Standardville, 213.2; Mohrland No. 2, 212; Hiawatha No. 1, 211.4; Mohrland No. 1, 210.6; Utah, 209.6; Black Hawk, 209.2; Winter Quarters, 209; Kenilworth, 202.8; Hiawatha No. 2, 190.4.

The character of work performed by the various contestants was highly commended by the judges and surgeons present at the meet. Individual efforts compared very favorably with those shown at any of the large meets of the East. Great proficiency in bandaging was displayed by several teams.

Although the safety-first movement is not new in the state and some of the mines have trained men in first-aid work for many years, the past year has shown both the miners and the various mining companies working together with greater interest than ever before, and the results seem commensurate with the greater efforts expended.

First-Aid Meet of the "Old Company"

The Lehigh Coal & Navigation Co., familiarly known as the "Old Company" in the Anthracite region, because

it is the oldest in the history of mining in this country, held its annual outing at Lakeside Park, East Mahanoy Junction, Aug. 29 of this year.

As usual the meet while giving first place to first-aid, also comprised field and water sports. The problems were as follows:

1. Treat a foreign body in the left eye, and laceration of left hip. One-man event. Time, 3 min.
2. Treat a simple fracture of left collar-bone, and laceration of scalp. Two-man event. Time, 3 min.
3. Treat a simple fracture of left thigh, and a compound fracture of right upper arm. Team event. Time, 10 min.
4. Treat a fracture of left kneecap, a fracture of right thumb, and extensive lacerations over right shin bone. Team event. Time, 10 min.
5. Treat conditions of a man who has fallen on an electric wire, back down, whose clothing is burning; rescue, extinguish fire, treat patient and dress back and upper arms. Team event. Time, 10 min.

The judges were as follows: Drs. E. H. Kistler, W. H. Kastem, M. H. Neumiller, W. F. Ely, W. C. Scott and R. Kistler, of Lansford; Dr. J. E. Beale, of Coaldale; Dr. W. H. Hinkle, of Tamaqua; Dr. J. H. Behler, of Nesquehoning, and Dr. B. A. Erwin, of Mauch Chunk.

The first prize of \$25 in gold and individual silver medals



THE CROWD AT THE ANNUAL OUTING OF THE LEHIGH

was won by the Nesquehoning Outside Team, consisting of William J. Adams, captain; Oscar Strohl, Clarence McGerry, William Strohl and Samuel Azer. The second prize of \$15 in gold fell to the Electrical Department—Harold Ramsay, captain; Thomas Wildin, George Israel, Harry Wheinmeyer and Warren Holmes. The third prize of \$10 was secured by Daniel J. Jones, captain; George Boyle, David Morgans, James Cunningham and Edward Minnick.

The ratings of the teams in the contest follow:

Team	Captain	Per Cent.
1—Nesquehoning Outside ..	W. J. Adams.....	100
2—Electrical Department ..	H. Ramsay	100
3—Lansford Shops	D. James	99
4—Tamaqua Inside No. 2...	C. Erbe	98
5—Coaldale No. 9 Shaft....	D. Moser	97
6—Lansford Outside	A. Gibson	97
7—Coaldale No. 8 Slope....	T. J. Evans	96
8—Nesquehoning Tunnel 2 ..	P. Bouse	96
9—Coaldale No. 8 Shaft ..	J. Boyle	96
10—Greenwood Inside	W. Sweeney	96
11—Nesquehoning Shaft No. 1	T. Hoffler	96
12—Tamaqua Inside No. 1 ...	O. Belts	95
13—Nesquehoning Shaft No. 2	J. Lewis	94
14—Nesquehoning Summit..	J. Forest	94
15—Lansford No. 4 Slope...	A. McMuller	94
16—Lansford No. 3 Shaft...	S. Hollenbach	94
17—Hauto Washery.....	E. Mulhearn	94
18—Nesquehoning Tunnel No. 1	C. Keeney	93
19—Tamaqua Outside	C. Gould	93
20—Lansford No. 4 Shaft...	H. McElmoyle	92
21—Lansford No. 6 Shaft...	D. Cuning	92
22—Coaldale Outside	W. Callahan	92

Team	Captain	Per Cent.
23—Rahn Shaft	J. Filer	92
24—Springdale	T. Whildin	90
25—Greenwood Outside	R. Werner	89
26—Foster's Tunnel	T. Thomas	88

The contest for supremacy in field sports followed. Each district had a limited number of representatives in each event.

The water sports were: 50-yd. swim with turn, 300-yd. single-oar boat race, chasing the duck, 100-yd. straightaway swim and 400-yd. double-oar boat race. The contestants representing different districts competed with each other, and a summary of points made by the contestants from each district provided a way of comparing the skill of the men thus classified. Lansford won with 16 points, Tamaqua being second with 14. Coaldale and Nesquehoning tied with 6 points, while Greenwood scored only 2 points.

The field sports were: Standing broad jump, 50-yd. dash for men over 50 years of age, 50-yd. dash for men weighing over 200 lb., running broad jump, 600-yd. two-legged race, 100-yd. dash, putting 16-lb. shot and tug-of-war. Lansford again won, with 26 points; Greenwood made 25, Tamaqua 12, Coaldale 7 and Nesquehoning 1 point. As a whole, Lansford won easily with 42 points, Greenwood having 27 and Tamaqua 26, but Coaldale made only 13 and Nesquehoning 1 point only.

A baseball game was played between teams from Carbon and Schuylkill Counties, the winning team receiving \$25. A dinner was served in the grove.



COAL AND NAVIGATION CO. IN LAKESIDE PARK, AUG. 29, 1914

Legal Department

Duty of Operator Concerning Safety of Mine

BY A. L. H. STREET*

In reversing a judgment which was awarded against defendant for death of a miner, caused by fall of a mine roof, the Washington Supreme Court decided these points in the recent case of *Lindquist vs. Pacific Coast Co.*, 142 Pacific Reporter: The legal principle that where an employee's place of work is constantly changing, as in the case of mining, he is presumed to assume risks of injury arising from the performance of his work, did not apply in this case, it appearing that the accident occurred in a room which was being operated on the pillar system. The foreman had inspected the place in the roof where a squeeze appeared, pronounced it to be safe, and directed the deceased employee to work there. The latter remained at work under such direction until the middle of the day, when the roof fell.

A workman who follows the assurance and judgment of his employer's representative, will not be charged with assumption of risk or contributory negligence, as a matter of law. The assurance is not that one blow may be struck or one shovelful of earth turned in safety, but that the place is safe long enough to accomplish the thing to be done, which, in this case, was to remove the coal from that part of the pillar where the squeeze occurred. But, if defendant company furnished a sufficient supply of timbers at the entrance of the working place, it could not be held responsible for the accident, merely because it did not provide for cribbing instead of posts and caps, and did not keep the chutes open on both sides of the section which was being worked, so that the coal might be removed from either side.

The requirement under the Washington laws that coal-mine operators shall deliver timbers for supports "at the entrance to the working place," is not shown to have been violated by reason of the fact that the timbers in this case were placed about 250 ft. from the place where they were to be used. It was a question for the jury to determine whether it was proper mining in this case to remove the coal from one side of the section to another, and whether the fact that the chutes on one side had caved in would charge the miner with assumption of the risk or contributory negligence.

Recent Judicial Decisions

Validity of Virginia Wage Law.—The Virginia statute which prohibits coal operators and manufacturers from issuing orders in payment of wages, unless such orders are redeemable in cash, is valid. (*United States Supreme Court, Keokee Consolidated Coke Co. vs. Taylor*, 34 Supreme Court Reporter 856.)

Proof of Negligence in Fatal Injury Cases.—*Mother's Right to Recover Damages.*—A coal company cannot be held

responsible for death of an employee in an accident to which there were no eye witnesses, on mere conjecture as to the cause of the accident; there must be proof reasonably tending to show that the injury was caused by some act of negligence attributable to the company. But, in the absence of evidence to the contrary, it will be presumed that the employee was in the exercise of ordinary care for his own safety. Under the laws of Wisconsin, the mother of an illegitimate son is entitled to recover damages for his death due to negligence of a third party. In any case a mother will not be permitted to recover on account of a prospective loss of support by her son after he would have attained his majority, unless there is evidence showing such loss to a reasonable certainty, and the amount thereof. (*Wisconsin Supreme Court, Andrzejewski vs. Northwestern Fuel Co.*, 148 Northwestern Reporter 37.)

Mechanic's Liens Against Mining Property.—A lessee under an ordinary lease for mining coal on a royalty basis is not a "contractor" of the landowner in such sense as to entitle his employees to enforce a lien against the property. (*Colorado Court of Appeals, Empire Coal Co. vs. Rosa*, 142 Pacific Reporter 192.) In denying the right of employees of a lessee to a mechanic's lien, the court said: "The work done, as shown by the evidence, was that usual, ordinary, and necessary in the regular course of operating a coal mine, in extracting coal therefrom, although involving a small amount of 'dead work,' driving an entry (but whether in coal or not is not disclosed), and laying some track. Besides, it nowhere appears what part of the labor sued for was performed in doing anything that might be termed development, preservation, or improvement of the mine, as distinguished from the mere extraction of the coal, and if some items are lienable, the amount cannot be ascertained from the evidence so as to form the basis of a decree."

Employer's Duty Concerning Safety of Mine Roof.—When a mining company's foreman undertakes to inspect the roof of a mine room to ascertain whether it is safe for a miner who is about to work under it, the company, acting through the foreman, is bound to exercise a reasonable degree of care to discover any dangerous conditions existing in the roof, even though it may ordinarily be the duty of the miner to look after the safety of his own room, the company merely providing props. Hence, if it appeared in a suit for injury to a miner, caused by rock falling on him, that, being somewhat inexperienced, he asked his foreman whether he thought any more of the roof would fall, and the foreman tested the roof with a pick and assured plaintiff that it was safe, the jury were warranted in finding that the injury was due to negligence attributable to the company, if the foreman's failure to make a proper inspection resulted in his overlooking the dangerous condition which caused the injury, and if plaintiff was induced to continue his work, in reliance upon the foreman's assurance. (*Missouri Supreme Court, Manufacturers Coal & Coke Co.*, 168 Southwestern Reporter 927.)

Width of Barrier Pillars in Pennsylvania Mines.—A Pennsylvania law enacted in 1891 requires the owners of adjacent coal properties to leave a boundary pillar sufficient as a barrier for the safety of the miners in each of the adjoining mines, in case the other should be abandoned and filled with water. The width of the pillar is to be determined by the engineers of the adjoining property owners, together with the inspector of the district in which the mines are situated. This law has just been before the Pennsylvania Supreme Court again in the case of *Mill Creek Coal Co. vs. Curran*, 91 Atlantic Reporter 424, a suit brought to declare illegal an award fixing the width of a barrier pillar of coal between the mines of two operating companies. Summed up, the court's opinion, in effect, is that the law was a valid exercise of the legislature's power; that the power given to determine the width of a barrier between two given mines includes authority to determine whether the safety of employees in the two mines requires a pillar of any width; that a decision by the engineers and inspector fixing the width of a pillar will be presumed to have been reached after considering the necessity for any pillar at all; and that a valid decision may be reached by a majority of the members of the board created by the law.

*Attorney at law, St. Paul, Minn.

Discussion By Readers

Gasoline Mine Locomotives

I read with much interest the letter of E. W. Hamilton, *COAL AGE*, Sept. 12, p. 440, drawing attention to the particular advantages to be derived in the use of gasoline locomotives, in mine haulage.

In this connection, I wish to refer briefly to some very important facts brought out in a recent paper read at the Pittsburgh meeting of the American Institute of Mining Engineers, October, 1914, by O. P. Hood, Chief Mechanical Engineer of the Federal Bureau of Mines. In his paper, Mr. Hood has enumerated some of the results of the extensive experiments made by the bureau to determine, as nearly as possible, to what extent the use of gasoline motors is dangerous to life or injurious to the health of miners, under the worst possible conditions that may exist in the operation of coal mines.

After speaking of the "great flexibility, ease of control and economy of operation" of electric haulage and the "serious menace" of the trolley-wire system of distribution, Mr. Hood gives equal emphasis to the "greater flexibility of application" secured by the use of gasoline locomotives in mines, without a similar dangerous distributing system. He contrasts the danger of death by electric shock with the injury to health and possible death by the corruption of the mine air with the exhaust gases of the engine. He states that these gases consist of "nitrogen, a little free oxygen, hydrocarbons, hydrogen, carbon monoxide and carbon dioxide."

The exhaustive study made of mine air and gases, by the engineers of the bureau, to which Mr. Hood refers, (Technical Paper No. 62, U. S. Bureau of Mines) leads him to conclude that the determining factor, in respect to the danger arising from the use of gasoline motors in mines, is the presence of carbon monoxide in the exhaust gases of the engine. He adds that the percentage of this gas in the mine air will depend upon the amount of the gas present in the exhaust, as compared with the quantity of air passing on the haulage road; but he considers that it will be necessary to provide ventilation for the worst condition that can result.

It is stated that while, under normal running conditions, this gas rarely exceeds 6 per cent. of the total exhaust, the quantity may, owing to a bad adjustment of the carburetor, be increased to 13.5 per cent. It is clear that since such a wide variation in the percentage of this dangerous gas is possible, this fact coupled with the possibility of a slack ventilation on roads or in places where the locomotive may be working, makes it necessary to observe great caution in the use of these machines.

Mr. Hood gives a table showing the percentages of carbon monoxide and carbon dioxide gases that may be produced by the different sizes of engines in common mining use, number of cylinders, speed (r.p.m.) and piston displacement, together with the quantity of air required to dilute the carbon monoxide to 0.1 per cent. He draws attention to the possibility of the locomotive running in the same direction in which the air current

is traveling and perhaps with the same speed or velocity, in which case the gas would reach a dangerous percentage in the air to which the engine runner would be exposed. He mentions also the danger of permitting a gasoline locomotive to stand idle for any length of time, except in an ample ventilating current, and advises the use of a self-starter on all gasoline locomotives.

MINING ENGINEER.

Pittsburgh, Penn.

Waste under the Ohio Mine-Run Law

All familiar with the systems and methods of mining coal now employed, in eastern Ohio, know that not more than 65 per cent. of the coal is recovered or mined as marketable coal. As slack is being sold today, in the Cleveland market, for 15c. a ton, one cannot but feel that there is considerable reason in the resistance that is being made, by the coal operators in the No. 8 Ohio field, to the mine-run law that a short-sighted government has forced upon an already superlegislated industry.

Under the operation of this law, the miners are not concerned in the amount of slack and fine coal that they load into the cars. It is passing strange that legislators charged with the duty of enacting such laws as will prove a benefit to the state, its industries and the workers, alike, should continue to whittle down the small margin by which the coal industry lives. That the state of Ohio is losing hundreds of thousands of tons of coal, in the No. 8 field, is a fact known to all miners, operators and inspectors alike. In my opinion, time will undoubtedly fix the responsibility for this waste and loss, not upon the industry but upon the law-making body, for the enactment of laws that serve no other purpose than to waste the resources of the state by compelling a profligate system of mining.

There is, in the recently enacted mine-run law in Ohio, an innocent and harmless looking item, which the miners' union forced upon the operators of the No. 8 field, to the effect that "rooms shall be 24 ft. wide, with the track in the middle of the room." This practically lays down the law in regard to the system of mining to be adopted; and compels the operator to consent to a heavy loss both to himself and to the state. The method of laying the track in the middle of a room, as all mining men know, precludes the drawing of pillars, under most conditions in coal mining; because the drawslate and other refuse is gobbled against the pillars and must be removed before the work of drawing back the pillars can be commenced. The cost of removing this waste would be prohibitive, and the pillar coal would be often abandoned.

In the Pittsburgh district, the same union, inspired with a greater sense of justice, agreed that the track in the rooms should be laid close to one rib, which enables the pillars to be drawn back with little expense. All mining men know how important it is to obtain the largest possible percentage of coal from the rooms, to offset the

expense of driving narrow-work. On this account, it frequently happens that mining in the rooms is allowed to encroach upon the entries; and, under the conditions, one can hardly blame companies for this practice; although if it is carried too far, a squeeze is the almost inevitable result.

Besides the great waste it entails, there is no doubt in my mind that this system is responsible for a large percentage of the fatal accidents occurring daily in that field from falls of roof. If this be true, it is a matter that should concern the chief inspector and the safety commission. In respect to the unwarrantable waste of natural resources, this condition should interest every citizen, whatever his calling or standing.

Were it not for the prescribing of the system of working, by the union, in the manner to which I have referred, operators would be in a position to reduce the present waste in mining to a minimum, by adopting a system better suited to the conditions and which would guarantee the extraction of the largest possible percentage of the coal. While the union conceded this privilege to the operators in the Pittsburgh district, it was withheld from those in the No. 8 field, which was manifestly an unfair discrimination.

We may ask, Why is this system permitted, which entails so large a waste and great financial loss, and is a constant menace to life and causes an increased demand for compensation for injuries, besides other losses to the operators? Is it not evident that such laws are adding to the heavy burdens already borne by coal operators in this field? Is it possible that law-makers do not realize that while such laws may be a benefit to a few, they impose unjust burdens on the large majority? If such be true, they are betraying the trust placed in them.

One is forced to the conclusion, however, that under the working of the spoils system and the desire for long terms of office, the influence of the miners' union is allowed to control the better judgment of men who have it in their power to adjust these matters. It is to be regretted that, under this influence, the coal operator is rapidly becoming known as a common enemy, instead of the mainstay and support of a large and necessary industry. Such a situation is as deplorable as the strikes, that result, are expressive.

The demands on the coal operators of the No. 8 field are greater than those in any other district, as far as my knowledge goes. One great source of trouble is that, under existing conditions, each mine is a law unto itself, there being no general agreement. For example, one mine will be thrown idle if eight men are out of coal; another, if 10; and still another if 12 men so elect. The penalty for loading dirty coal differs in almost every mine. The occurrence of morning meetings in the mines, after all the daymen have entered, causes frequent stoppage of the work and a loss of two or more hours, which is a serious matter in the successful operation of a mine.

As a practical example of the interference of the union, in the operation of the mine, one local even essayed to prevent the superintendent of the mine from picking chunks of slate, sulphur, etc., off the top of the loaded mine cars, claiming that every car must first be weighed and its weight credited to the miner, who should be docked the necessary amount, after the coal is dumped. In this case, after a six days' strike, the men became more reasonable.

In closing, permit me to say that, until the coal operators, in the No. 8 field, are permitted to adopt their own system of mining, and until there is a greater desire on the part of the men in that district to live and let live, there can be neither success, satisfaction nor peace.

CHARLTON DIXON, Gen. Mgr.,
Franklin Coal Co.

Pittsburgh, Penn.

The Mine Foreman

Letter No. 11—I have often wondered why we do not hear more frequently, by way of discussion and the writing of practical articles, from the mine foremen of this country. There is not a man engaged in the coal industry who comes into closer contact with the practical side of mining than the mine foreman. As a class, they are busy men and often have little to say; but it is not because they have nothing to write about. If these men were so disposed, many of them could produce articles that would be of great interest to their fellows.

There is no occupation in which men are engaged that presents more varied conditions and experiences than the mining of coal. The mine foreman finds some fresh difficulty each day. His mind dwells constantly on the work. At home, he goes over plans for the next day, studying what will be the best and most economical way of making necessary changes or performing the daily routine work of the mine. In all his plans, the questions of safety and expense are of the first importance.

In the mine, the foreman is constantly confronted with questions that often demand an immediate answer, yes or no. In many cases, his decision will mean hundreds of dollars saved or lost to the company. It is important, therefore, that the mine foreman be a man of keen and reliable judgment. He must be able to work his men to the best advantage, and to secure the highest efficiency from their labor.

There is a great difference between considering a plan or method outlined on a map, when sitting at home or in the office, and being required to carry out the same work or execute the same plan in the mine. When a plan is handed to a foreman, he must consider how the work can be done in the quickest manner and with the least expense. He must regard the safety of his men and the requirements of the mining law, in respect to the work.

In a large mine where the mine foreman has a number of assistants who are in charge of different branches of the work, his duties require a general oversight of the mine, to see that the work is well done and the least expense incurred in the operation. Such a general oversight requires the broadest knowledge and judgment, both in respect to the men employed in different kinds of work and the manner in which that work should be accomplished.

In most mines, however, the foreman has little help and must give his entire attention to every detail of the work going on in the mine. He must be informed of every bad or dangerous rock, bad track, or a switch where cars are frequently derailed; and see that the trouble is overcome or the difficulty removed. At the same time he must keep things moving. He must see that all material required is at hand and brought into the mine and delivered promptly where it is to be used.

The mine foreman must inspect every working place while the men are at work, to ascertain that the coal is properly mined and loaded and the face suitably timbered and safe for work. He must see that each man has his needed supply of cars, timber and tracking, and that the place is well ventilated and free from gas. He must inspect the haulage roads, arrange the work of the drivers so that there will be the least delay and the coal arrive regularly and promptly at the bottom of the shaft or slope.

In these days of sharp competition, when machinery of all kinds and for all purposes is being introduced into the mines, it is essential that a mine foreman shall be familiar with the general principles of every class of machine, so that he will be able to judge of its practical adaptation to the work in the mine.

Again, the task of the mine foreman is rendered much more difficult, by reason of the fact that 95 per cent. of the men employed, in many mines, are foreigners and cannot speak the English language. The most of these men can only be made to understand by means of signs. Their instruction in regard to the safest and best method of mining coal requires much time and patience. The presence of these foreigners in the mine is a source of constant worry to the mine foreman, for fear that something will go wrong at any moment. Their ignorance of

conditions or neglect of the simplest precautions may cause an accident that will cost hundreds of dollars and, perhaps, jeopardize the life of every man in the mine.

Mine foremen, as a rule, are hard-working, conscientious men. In most cases, they shoulder their own burdens and do not trouble their superintendents with many small matters, although these may be a source of continual annoyance and trouble to them. In some cases, it would be better if the foreman would take up many small matters with his superintendent, with a view to the removing of the difficulty, as it often happens that a small matter neglected will grow to much larger proportions; and the expense of removing the difficulty will be much greater than if proper attention had been given the matter earlier.

It is a great help to the mine foreman when his superintendent is not too busy to go over matters with him in detail. This sociability shows that the superintendent has the welfare of the foreman and the men at heart; and the knowledge is a satisfaction to the foreman, who is encouraged thereby to greater effort. Such encouragement is greatly needed, because of the arduous work with which he is charged.

THOMAS HOGARTH, Mine Foreman,
Penn-Mary Coal Co.

Heilwood, Penn.

Study Course in Coal Mining

BY J. T. BEARD

The Coal Age Pocket Book

Duty of a Pump—There are different definitions for what is termed the "duty of a pump," each giving a different estimate or value.

The duty is sometimes defined as the weight (lb.) of water raised through a vertical height of 1 ft., for each 100 lb. of coal burned; or, more simply, the theoretical work (ft.-lb.) performed, per hundredweight of coal burned under the boiler.

It is observed that this definition is faulty, because it combines furnace and boiler efficiencies with that of the pump itself, besides estimating only the theoretical work performed, thus eliminating friction, which is often a most important factor.

The true definition of **duty in pumping** is the actual work performed in a given time (ft.-lb.), per million B.t.u. delivered to the pump in the same time. Or, less frequently, the duty is estimated in foot-pounds of work performed, per thousand pounds of dry saturated steam consumed.

Steam Consumption in Pumping—The common type of direct-acting pump, so much employed in mining, is well known to be wasteful in respect to the consumption of steam. This is owing to the necessity of using steam at full pressure throughout the entire length of stroke. Only a comparatively few pumps are designed to use steam expansively and these are not adapted to the commonly high lifts in mining.

Steam consumption, in pumping, ranges from 10 or 15 lb. per i.h.p. per hr., in triplex, flywheel pumps when run condensing, to an average of 150 lb. per i.h.p. per hr. in direct-acting pumps. The consumption of steam, in pumps of the latter type, varies from 100 to 200 lb. per hp. per hr., depending on the speed of the pump and its condition. In this class of pumps, the consumption of steam is less as the speed is increased.

To Calculate Steam Required to Operate Pump—For a direct-acting pump in fair condition, operated at a piston speed of 100 ft. per min., assume an average steam consumption per indicated horsepower-hour of, say 150 lb. dry saturated steam, which is a so called "water-rate" of $150 \div 60 = 2.5$ lb. per i.h.p.-min.; and multiply this water rate by the indicated horsepower of the pump, as shown by the following:

Example—Find the steam required to pump 9000 gal. of water per hour, from a shaft 450 ft. deep, using a simple direct, double-acting pump running at a speed of 100 ft. per min., and discharging through a 3-in. column pipe.

Solution—The effective head, in this case, is

$$h_1 = 450 + \left(\frac{9000}{60} \right)^2 \frac{450}{800 \times 3^5} = \text{say } 502 \text{ ft.}$$

The indicated horsepower of this pump will then be

$$H = 0.00034 \times 150 \times 502 = 25.6 \text{ hp.}$$

The weight of steam required to operate this pump, under the assumed conditions, will be

$$\text{Steam consumption, } 2.5 \times 25.6 = 64 \text{ lb. per min.}$$

The Coal Age Pocket Book

To Calculate the Duty of a Pump—First, find the horsepower required to operate the pump under the given conditions, which is the indicated horsepower of the steam cylinder and may be calculated from the work performed in the water-end of the pump, assuming for that purpose a mechanical efficiency of, say 75 per cent. Multiply this horsepower by 33,000 to reduce to foot-pounds per minute.

Now, find the heat units (B.t.u.) per pound of steam used in the cylinder each minute, and multiply this **heat value** by the **water-rate** for the class of pump employed, and that product by the indicated horsepower, which will give the total heat (B.t.u.) converted into work each minute.

Finally, since this total heat energy is to be expressed in million B.t.u. when estimating the duty of a pump, multiply the foot-pounds of work performed each minute by 1,000,000 and divide the product by the total heat consumed in the same period of time. The quotient obtained will be the duty of the pump expressed in foot-pounds.

It is important to observe that the basis of estimating duty, in pumping practice, is purely an arbitrary one and varies greatly among engineers; so that it is necessary, in giving the duty of a pump, to state the basis of estimate employed. Otherwise, the duty given is of no value as demonstrating the efficiency of the plant.

Duty is very commonly estimated, as above, on a basis of million B.t.u.; or, as many engineers prefer, on a basis of thousand pounds of dry saturated steam consumed, per unit of time. Aside from this difference, however, the heat in the steam is sometimes taken as the total heat above 32 deg. F. and sometimes above the feed-water temperature. The latter method would seem to be preferable inasmuch as it considers the ratio of the work performed, to the heat in the steam derived from the combustion of the fuel in the furnace. It eliminates the heat imparted to the feed water by the condensation of waste steam in the feed-water heater. It may therefore be a better index to the comparative cost of pumping, without confusing the efficiencies of the pump, boiler and furnace.

Example—Referring to the last example, where it was found 25.6 hp. was required to pump 9000 gal. of water an hour, under an effective head of 502 ft., assume a feed-water temperature of 100 deg. F. and the diameter of the steam-end double that of the water-end and find the duty of the pump, on the B.t.u. basis, above feed-water temperature.

Solution—The work performed is $25.6 \times 33,000 = 844,800$ ft.-lb. per min. When the pump is in operation the pressure in the water-end is $0.434 \times 502 = 217.8$ lb. per sq.in. The diameter ratio being 2, the required steam pressure is $217.8 \div 2^2 = \text{say } 55$ lb. per sq.in., gage or $55 + 15 = 70$ lb., abs.

From steam tables, water at 100 deg. F. contains 67.9 B.t.u. and steam at 70 lb. abs., 1179.9 B.t.u., per pound. Since this pump uses 64 lb. of steam a minute, the total heat in the cylinder is $64 (1179.9 - 67.9) = 71,168$ B.t.u. per min.

$$\text{Duty of pump, } \frac{844,800 \times 1,000,000}{71,168} = 11,870,500 \text{ ft.-lb.}$$

Inquiries of General Interest

An Electric Mine-Haulage Problem

I have been studying to become more familiar with the observed action of an electric mine locomotive, and am puzzled to explain to my own satisfaction the following question: Why will an electric mine locomotive pull more on series than on parallel? For example, should a motor stall on account of defective bonding when running on parallel, it will at once start and haul the trip if thrown over on series.

FRED VINTON, Mine Foreman,
Penn-Mary Coal Co.

Heilwood, Penn.

To answer this question intelligently, requires not only an intimate knowledge of the construction of the motor in use, but a thorough understanding of the principles involved in its action. The study of electricity is a difficult one, and there are many troubles continually arising that even expert electrical engineers find hard to fully explain.

The question correspondent has asked is interesting and worthy of careful study on the part of anyone in charge of an electric locomotive. In the present case, it may be assumed that the mine locomotive here referred to is equipped with two series-wound motors. These mo-

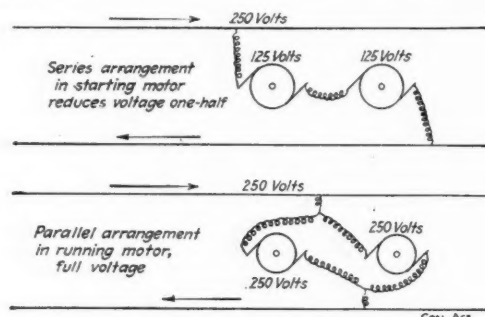


DIAGRAM SHOWING THE SERIES AND PARALLEL ARRANGEMENTS IN MINE MOTORS

tors, on a locomotive or a trolley car, are usually arranged so that they can be operated in series when starting the motor and can then be thrown into parallel, after the motor has attained the desired speed.

Briefly stated, the object of this is to reduce the voltage one-half and thereby prevent the large rush of current that would take place in starting owing to there being, as yet, little or no electromotive force set up in the armature winding. As the speed of the motor is increased gradually, the electromotive force, which is then set up in the armature winding, opposes that produced in the motor field, with the result that the flow of current is restrained. Also, by means of the controller used in starting the motor, a gradually decreasing amount of resistance is introduced into the circuit, which likewise has the effect of regulating the current flowing through the motors.

The accompanying diagram illustrates both the series and parallel arrangements; and enables one to see more clearly how the voltage is reduced one-half, in the series arrangement; while the full voltage, disregarding the losses mentioned later, is available in the parallel arrangement. It is evident that when the total current is passing in succession through each of the motors, as in the series arrangement, each will absorb one-half of the voltage available at that point. For example, assuming the difference of potential between the trolley wire and the rail at the motor is 250 volts, each motor will be operating under one-half this pressure, or 125 volts in the series arrangement; while in the parallel arrangement each motor will be subject to the total pressure of 250 volts.

There are numerous sources of motor losses that in a direct-current, electric motor can be classified under three heads, as follows: (1) "Copper-loss" due to the resistance of the conductors on the armature and field windings, which in a well designed motor running under full load varies from 12 to 14 per cent. of the input, or less for a lesser load; (2) "Core-losses," which consist of the eddy-current losses that vary as the square of the speed of the motor, and the loss due to hysteresis that varies directly as the speed. Core-losses vary in different machines and result from the revolution of the armature laminations in a magnetic field, thereby producing eddy currents opposed to the field current of the motor. Hysteresis results from the tardiness of the magnetization in the metal, which, owing to the rapid reversal of current in the armature iron, considerably reduces the magnetic field; (3) Friction-losses in the bearings of the motor and the brushes and what is called "windage," due to the friction of the air against the revolving armature, which is slight.

Returning now to consider the power of a motor installed in a mine locomotive to pull its load, it may be stated that the tractive force or drawbar pull of the locomotive depends as much on the adhesion of the wheels to the rails as on the power exerted by the motor itself. Assuming, however, that the weight of the locomotive is such that its adhesion to the rails is sufficient for the power of the motors installed in the frame, it is only necessary to consider the torque or turning moment of the motors.

In a direct-current, series motor, this torque varies with the square of the current and is practically independent of the voltage, except as the losses to which we have referred, affect the speed of the motors, by decreasing the voltage. A lower voltage means a lesser speed, which reduces the losses but increases the available torque. By reason of this condition, motors operated in series possess a slight advantage in respect to torque, which measures the tractive effort of the locomotive. However, the chief advantage of the series arrangement in starting is the consequent reduction of the voltage one-half, which makes the expedient a valuable one in haulage.

Examination Questions

Firebosses' Examination, Held at Terre Haute, Ind., Sept. 10, 1914

(Selected Questions)

Ques.—If you were employed as fireboss, explain fully how you would conduct your examination of a mine for firedamp, from the time you commenced your work until you had completed it.

Ans.—I would reach the mine in time to begin work promptly, making sufficient allowance for properly inspecting and lighting my lamp and ascertaining that the ventilating apparatus was working as usual. Having descended the shaft or slope, I would proceed at once to follow the intake air from the point where it enters my district and to inspect in regular order all airways, passages and rooms, following the air current throughout the district.

When entering a room and approaching the working face I would proceed with caution to avoid walking into a body of gas, making such tests as are necessary to determine the presence or absence of gas. Every fireboss should, also, closely observe the condition of the roof and coal in each room to assure himself that the place is safe for workmen to enter. He should replace any brattice that may have been blown down by the shots discharged in that place. Having made this examination, I would mark the date on the face of the coal, as evidence of my presence at that point.

I would do the same at the face of each room and entry and then return to the shaft or slope bottom and enter in a book kept for that purpose my report of the examination, dating and signing the same. I would state in that report any particular dangers I had found. When making the examination I would place suitable danger signals and fence off any places found unsafe for men to enter. If the check system is in use at the mine I would remove from the board the checks of the men working in such places and deliver the same to the mine foreman, explaining to him the particular danger in each place. This would prevent any workman from entering a dangerous place unwarned.

Ques.—(a) What safety lamps do you know of that are in use, and which would you prefer to use in making an examination of a mine for firedamp? (b) Give reasons for your choice. (c) Explain the construction of the safety lamp of your choice.

Ans.—(a) The lamps most commonly used for testing for gas are the Davy and Wolf lamps. I prefer to use the common Davy lamp when making an examination for firedamp.

(b) The Davy lamp is simple in construction and very sensitive to the presence of gas. The lamp is convenient to handle, easy to clean and can be inspected in every part without trouble. It burns a nonexplosive oil and, when properly handled is a safe lamp to use.

(c) The Davy lamp consists of an oil vessel surmounted by a gauze chimney, which may be and usually

is protected with a shield, to avoid the flame being blown through the gauze by a strong air current or heavy concussion of the air. The mesh of the gauze chimney contains 28 wires to the inch or 784 openings to the square inch. This chimney is $1\frac{1}{2}$ in. in diameter and about $4\frac{1}{2}$ in. high, in the fireboss Davy. The top of the chimney is further protected by a gauze cap, which is often called the "smoke gauze." The air supporting the flame enters the lamp in the lower part of the chimney and the gases produced by the combustion escape at the top.

Ques.—(a) If, on making an examination of a mine, you should find a large accumulation of firedamp at the head of a pair of entries where it had not been previously detected, to what cause or causes might this be attributed? (b) What precautions would you take to prevent an accident as the result of such an accumulation of gas?

Ans.—(a) The presence of the gas at the head of the entries might be due to the last shot fired at the face having opened a fresh feeder of gas either in the coal, the roof, or the floor. The shot may have caused a heavy fall of roof that has produced the same effect. In some cases, such a sudden accumulation of gas may result from a squeeze or creep extending over the head of the entries; but this is not possible except when the entries are in close proximity to other workings. Gas often makes its appearance suddenly when an entry strikes a fault and this may have produced the accumulation found in this case at the head of the entry.

(b) If the body of gas is large, no attempt should be made to remove it from the head of the entry, until all of the men working on the return of that current have been withdrawn. The gas should then be removed by starting a line of brattice from the outby corner of the last crosscut at the head of the entries and extending this gradually toward the face. As this brattice is extended, time should be given for the air current to sweep away the gas. Only safety lamps should be used in performing the work. While this test is being performed, every approach to the return current should be carefully guarded to prevent anyone entering the return airway with an open light or unwarned. If necessary, the air current should be increased sufficiently to enable the complete removal of the gas.

Ques.—Is it possible to increase the quantity of air circulating in a mine, without increasing the power producing the circulation; and, if so, by what means may this be accomplished?

Ans.—Yes. Without increasing the power producing the circulation, the quantity of air passing through the mine may be greatly increased by cleaning up the airways and removing every obstruction to the passage of the air current; also, by shortening the distance the air must travel; also, by splitting the air current one or more times, as this is found to be practicable. Wherever this is required, the crosscuts or breakthroughs should be enlarged to the full size of the entry, and all leaky doors, stoppings, brattices and air bridges made airtight.

Coal and Coke News

Harrisburg, Penn.

Final argument was heard recently, in the Dauphin County Court, in the mandamus proceedings brought against the chief of the Department of Mines on the issuing of certificates of eligibility to some of the men recommended by the mine foremen's examining boards, and in the injunction case brought by the United Mine Workers against the Chief of the Department of Mines from issuing certificates to certain men, who they allege never had actual experience at the face.

Involved in this suit is the question, whether the term "five years' practical experience as a miner" means five years' employment inside the mines, as was interpreted by ex-Attorney General Elkin (now Chief Justice of the Supreme Court) and by Attorney General Bell, during the early part of the year, or does it mean five years in the actual cutting of coal?

At the hearing held on Sept. 25, expert witnesses testified that the term "miner" in the anthracite region means the man who gets out the coal, but did not confine their opinion strictly to the cutting or blasting of that mineral.

Ex-Judge Shay argued that the court had no jurisdiction in the case, as it could not go behind the recommendations of the board appointed by the court, and cited the case brought by Thomas Reese against the Mine Inspectors' Examining Board of Schuylkill County, in which case the court decided it had no power to change the decision of the board. He also argued that the duties of the Chief of the Department of Mines were purely ministerial and that he had no right to hold up the certificates of the men recommended by the several boards, which is now being done until a decision is handed down in the injunction case.

Ex-Congressman Reilley, representing the United Mine Workers, argued that the word practical means a man who actually cuts the coal at the face, and that even expert witnesses testified that a man should have at least two years' experience at cutting coal at the face before becoming mine foreman. He stated that 70% of the fatal accidents in the anthracite mines occurred at the face, and that it is the man with the experience of cutting coal at the face that should become the mine foreman, so he would know how to advise and look after the man who is doing the most dangerous work, and the operator whose property he is in charge of, also to safeguard the people on the surface, who are liable to be affected by mine caves, due to an incompetent mine foreman.

Mr. Reilley also quoted as follows an article from one of the annual reports of the Chief of the Department of Mines, as to who should become mine foreman:

"One of the most important officials in the anthracite coal mines is the mine foreman. The welfare of the mining interests depends largely upon the vigilance, care and efficiency of these officials, and when they are incompetent, they are a menace to the lives of the miners and the property of the operators. The mine foreman should be qualified for his position, not only by practical experience in mining coal, but by experience in the other branches pertaining to mining operations. He should also be a man of good character and of necessity he must possess a high average of intelligence in order to pass the examination required by law—an examination that is or ought to be as stringent as a Governmental Civil Service examination. The mine foreman, it may be stated, is the only mine official of whom the law demands proof of qualification to perform the duties of his position; and in view of the responsibility that attaches to his position it is to be regretted that the examining boards are not more careful in passing upon the candidates for this office."

The attorneys for the United Mine Workers in their argument claimed that the interpretation of the law as given by the attorney general conflicts with the miner's certificate law which reads that a man must have at least two years' experience at the face before he can get a "miner's certificate" and in view of this law, that the legislature intended the word "practical" to mean the actual cutting of coal at the face. In reply to this Judge Shay stated that if that were the intention of the legislature, then the governor would have to go down into the mine and up to the face

of the breast to select a chief for the Department of Mines, for the qualification of this office calls for "10 years' practical experience as a miner."

An early decision is expected in the case.

PENNSYLVANIA

Anthracite

Scranton—Headed by Rev. Roderick MacEachon, a Catholic priest who is active in the affairs of the local in which he has held membership for years, a delegation of union miners from eastern Ohio was recently in Scranton to confer with President John T. Dempsey and Secretary-Treasurer John M. Mack of the first anthracite district.

The miners of eastern Ohio have been on strike for months and appeals for aid are being made throughout the jurisdiction of the United Mine Workers of America. Miners from the Lehigh region contributed \$3000.

Danville—The coal dredging season, the best in many years, is drawing to a close and already some of the dredges have ceased operating for the year. The first rise in the Susquehanna River will probably put an end to all the operations. The exceptionally fine season is due to the fact that throughout the summer there were frequent rains and as frequent rises in the river, with the result that the coal was brought down in large quantities.

Dupont—The officials of the Hillside Coal & Iron Co. have warned the property owners at the intersection of Ford and Williams Sts. that a cavein is expected. Ford St. is closed to traffic and employees of the Butler colliery erected fences at the Williams and Broad St. entrances. The residents have been warned to keep little fire in their stoves in case the settling may disturb their homes. Several weeks ago a cave occurred on Williams St. and carried down the tracks of the Scranton Traction Co. together with the brick pavement. On Oct. 13 a watchman discovered a cave in the Delaware & Hudson R.R. in Judge's Cut. It was about 40 ft. long and let down the northbound tracks several feet. Cars of ashes were rushed from Scranton, the hole filled, and traffic was resumed in a few days.

Port Bowkley—Considerable damage was done at Prospect colliery of the Lehigh Valley Coal Co., on Oct. 15, when the sheave wheel and part of the hoisting tower at the Prospect shaft were partially demolished, due to the cage being hoisted too high. The sprocket chain that runs the hoisting indicator broke and the engineer, who was hoisting a car of coal at the time, thought he could raise the car to the dumping chute in the head of the tower, without the use of the indicator. He mistook the distance and the overwind resulted. While repairs are being made to Prospect shaft all of the coal will be hoisted through the Oakwood shafts.

Shamokin—Six hundred members of the Shamokin and Mt. Carmel Mining Institute, including officials of the Mineral, Susquehanna and other coal companies, held a banquet at Maysville park on Oct. 17.

Audenberg—It is feared that the first serious trouble since the signing of the agreement between the operators and men of the Lehigh & Schuylkill district may result from the action of the Lehigh & Wilkes-Barre Coal Co., in changing the powder used and raising the price at its No. 4 colliery.

Freeland—Trouble is said to be brewing between the stripping workers who belong to the United Mine Workers of America, and the steam shovel engineers' union. The latter are reported as having refused to recognize the former as union men despite the fact that they belong to the greatest union in the world. It does not sound reasonable that such a condition should exist when it is a positive fact that the stripping workers are now working for better wages and under better conditions than ever prevailed before they became affiliated with the U. M. W. of A.

Hazleton—By the breaking of a rope attached to the first car being hoisted over an inside plane in the shaft colliery of the Lehigh Valley Coal Co., the car ran away on the plane, dashed to the bottom and injured five men, before they could get out of the way. One of these men, Andrew McKelvey, of Hazleton, died soon after in Hazleton State Hospital from his injuries.

Tamaqua—When the Lehigh Coal & Navigation Co. agreed to reinstate four men discharged at the No. 11 Colliery pending a settlement of the grievances, 500 employees who went on strike recently returned to work.

Wilkes-Barre—The slate pickers of the Nottingham Colliery of the Lehigh & Wilkes-Barre Coal Co. recently went on strike for a longer work day, tying up the operations of the colliery. The breaker has been working on an eight-hour schedule, and the boys complain that their pay was too small.

Exchange—It is reported that a coal bed has been discovered on the farms of T. C. Dennis and William C. Houghton. This measure was discovered during well digging operations. It lies at a depth of between 70 and 80 ft. and ranges between 3 and 4 ft. in thickness. Preliminary tests go to show that it is a fair grade of anthracite.

Bituminous

Indiana—Austin Swartz recently transferred to the Operators' Coal Mining Co., of Johnstown, something over 135 acres in Wheatfield Township. This is a part of the coal-field that is now being developed by the Conemaugh Smokeless Coal Co., near Seward.

Connellsville—The coke trade has reached the lowest point of the year with shipments of 244,000 tons per week. Each coke seller is anxious to retain such trade as he has, and any extra coke that may be required is readily arranged for without a general inquiry being made. The coke market is, however, in apparently no worse condition than the local pig iron market which is entirely stagnant.

WEST VIRGINIA

Charleston—The Hitchman Coal & Coke Co. has announced its intention of making a special effort to have the Supreme Court of the United States review the action of the Circuit Court of Appeals in reversing the holding of the district court to the effect that the United Mine Workers is an unlawful organization. Judge Dayton, of the Federal district court of West Virginia, enjoined W. B. Wilson, now Secretary of Labor, and other officials of the United Mine Workers, from attempting to unionize the mines of the company named, on the ground that the organization was intended for an unlawful purpose. This holding was reversed on appeal, and while the coal company has no right of appeal, under the circumstances of the case, it believes the matter is sufficiently important to be passed upon by the Supreme Court, which may, in its discretion, review the case if it so desires.

The list of fatalities in the coal mines of West Virginia during the month of September shows that 30 miners lost their lives during the month, this being a decrease of 2 from the previous month. Falls of coal and slate were responsible for 16 deaths, nine were due to mine cars, three to motors, one to electrocution, and one man was killed by a railroad car at the tippie. Many of these accidents were caused by the carelessness of the men themselves, a lack of discipline on the part of the employees being responsible. Mine foremen are especially urged in the letter accompanying the report from the chief of the Department of Mines to give more attention to conditions at the working face and insist upon proper timbering.

The eyesight of all foremen and fire bosses in West Virginia is being tested so that they will be fully qualified to detect gas in any place in the mine which they may examine. An order to this effect was recently issued by Earle A. Henry, chief of the mining department, after a conference with coal operators throughout the state. The operators fully approve of Mr. Henry's ideas and advised him to issue the order, they promising their hearty cooperation.

Huntington—According to records of the Chesapeake & Ohio R.R., West Virginia and Kentucky coalfields for the first 13 days of October loaded 50,000 tons in excess of the amount loaded during the same period of last month. A total of 904,010 tons of coal was loaded from Oct. 1 to 13, inclusive, an increase of 50,165 compared with 853,845 tons loaded during the same period of last month. It is believed that should no unforeseen contingency arise, the coal loading record will be broken this month.

Wellsburg—One of the largest coal deals ever consummated in Brook County was completed recently when Joseph and James Guida, operating under the name of Guida Brothers, sold their interests outright to Stephen Ertle of Pennsylvania and Leonard Wolfe of Brilliant, Ohio. The purchasers will continue to operate the mine. The coal property involved brought \$100 per acre.

Bluefield—Judge H. C. McDowell in the Federal District Court in Lynchburg, recently entered a decree in accord with the recent mandate of the United States Circuit Court of

Appeals at Richmond, awarding Mrs. Ollie H. Browning the sum of \$61,875 in unpaid royalties and \$96,816.75 unpaid purchase money for Taxewell County, Va., coal properties which have been in litigation in the Federal District Courts for several years. The decree was entered in the suits of Thomas Boswell against the Big Vein Pocahontas Coal Co. and the Colonial Trust Co., of Baltimore, against the same defendant.

KENTUCKY

Middlesboro—E. P. Nicholson and F. D. Hart, Jr., have announced that they have taken over the Low Ash Coal Co.'s property located near Excelsior, Ky. This is a shaft mine, one of two in this district, and opens into the Bonner seam, which yields a fine grade of coal. They are experienced operators and expect to begin shipping in a few days.

Central City—Some 600 miners in the employ of the Central Coal & Iron Co., in the mines both here and in Ohio County, were out of work for some time recently as a result of a disagreement between the union miners and officers of the company. The Central City mine previously was closed down for three months while a new tippie was in course of construction and other improvements under way at a cost of \$50,000 and resumed work for only a short time before the disagreement developed. The Central company is not a member of the Western Kentucky Coal Operators Association and it therefore was not in position to arbitrate the differences with the Mine Workers. Work was resumed pending settlement.

OHIO

Warnock—The Youghiogheny & Ohio Coal Co.'s store at Warnock was recently robbed by two foreigners who are said to be miners. The robbery was not discovered until the store was opened in the morning, when it was immediately closed until bloodhounds could be brought from St. Clairsville. The dogs had but little trouble in finding a trail and soon took the sheriff to a house where the loot from the store was found, together with the two foreigners.

Glouster—A call has been issued for a meeting of the miners of the Sunday Creek Coal Co. and the Pittsburgh Coal Co., to take place on Saturday, Oct. 31, for the purpose of agreeing upon some uniform system of weighing which will be in accordance with the provisions of the Ohio screen law. A straight run-of-mine system is desired, as at some mines a double draft system is used and at others a percentage is added to the screened lump. The miners assert that they agreed temporarily to permit the use of a weighing system other than that prescribed by the Green law, but that the operators have had time to comply with the law by this time.

ILLINOIS

Sparta—George and John Wilson, formerly connected with the Eden mine here, have leased the mine of the Boyd Coal & Coke Co. from the estate of W. R. Borders, who formerly operated it, but who lost his life in the Athletic Club fire in St. Louis the early part of the present year. The mine is being pumped out, and arrangements made for operation within the next 30 days.

Willisville—As a result of a feud between American and Italian miners at this place, which came to a head on the street here a week ago, two Americans and two Italians were killed. Feeling runs high, but the authorities contend that they can maintain peace.

Edwardsville—The Home Trade Co. of Edwardsville is the first coal mine in the United States to announce that Eagle trading stamps will be given with coal purchased at the mine. George D. Worden, superintendent of the mine, is determined to give this scheme a thorough tryout.

Livingston—Madison County has one of the largest and perhaps the greatest producing mine in Illinois. This is the mine of the New Staunton Coal Co. at Livingston, of which Thomas Hevenstreit is superintendent. During last year the mine worked 192 days and 7 hr. and averaged 4196 tons daily. The first two weeks of September this year showed an average of 4481 tons per day, and the last two weeks 4582 tons.

De Camp—The De Camp coal mine was recently sold by the master in chancery, Thomas T. Brewster of St. Louis, general manager of the Mt. Olive & Staunton Coal Co., bidding in the property. The latter would not disclose the identity of the purchaser for whom he was acting. Besides the actual coal mine equipment and coal rights to between 250 and 300 acres of land, the purchaser is also to receive 8 four-room cottages, and a two-story building suitable for use as a hotel or a boarding house.

MICHIGAN

Owosso—The Findley Coal Co., of Bay City, has secured control of the mines in New Haven Township, six miles north of Owosso, and is pumping out the shafts preparatory to resuming operations. These mines have not been operated successfully for 15 years. The Ann Arbor R.R. recently constructed a spur to them.

COLORADO

Denver—President Wilson is considering the advisability of withdrawing Federal troops from the Colorado coal fields as the result of the deadlock with the operators who refused to give approval to the President's plan for settlement of the strike. Governor Ammons is believed to be reorganizing the Colorado National Guard in order to make the presence of the Federal troops unnecessary.

WYOMING

Buffalo—The Owl Creek coal mine, which has not been worked recently, is on fire. Considerable volumes of smoke are issuing from the slope and the heat can be felt on the surface. This mine is valued at \$300,000 and it is feared that it may be a total loss. Spontaneous combustion is supposed to be responsible for the fire.

PERSONALS

W. H. Blaney, of Cannelsville, Ohio, recently purchased a controlling interest in the Corning Mining Co.

John Turnbach has tendered his resignation as superintendent of the C. M. Dodson & Co. collieries at Bever Brook and Morea.

Joseph Tumkolski, who was recently buried under a fall of coal in the Ebervale mine of the G. B. Markle Co., was rescued alive after six hours of entombment.

A. S. Tingley, a traveler with the Chapman Mining Co., has been made Ohio representative of the Commercial Coal Co. of Detroit. His headquarters will be in Columbus.

R. V. Norris, a consulting engineer of Wilkes-Barre, Penn., recently read a paper entitled the "Conservation of Anthracite Coal," before the engineering society of Wilkes-Barre, at the club room.

J. W. Reed, formerly mine inspector for the Consolidation Coal Co. in the Elkhorn District, has taken up his duties as Assistant State Mine Inspector. He was recently given the appointment by Governor McCreary.

Secretary B. F. Nigh, of the Michigan-Ohio-Indiana Coal Association, in his report for the month of September shows that in all 19 cases of freight collections were settled for the members of the association, which is the best month in the history of the organization.

A. Watts, one of the pioneer mine workers of Franklin County, Illinois, and who helped sink the Zeigler mine as well as those at Christopher, has resigned his position as manager of the Christopher mine, after several years of work, in which time he made this property the model mine in southern Illinois.

Effective Nov. 1. **F. B. Lockhart** of Cleveland, Ohio, president and general manager of the Baltimore & Ohio Coal Co., will be associated with **J. H. Hillman & Sons Co.**, Oliver Bldg., Pittsburgh, Penn. Until other arrangements can be made by the Baltimore & Ohio Coal Co., Mr. Lockhart will continue to act for it as heretofore.

Charles H. Thompson, of Darbyville, Va., vice-president and general manager of the Darby Coal Mining Co. and the Old Virginia Coal Co., and **W. J. von Borries**, a mining engineer of Louisville, Ky., have leased from the Haly Coal Co. a tract of over 2000 acres of valuable coal land on First Creek of the North Fork of the Kentucky River, in Perry County, Ky., three miles from the Lexington & Eastern Branch of the Louisville & Nashville R.R., and are organizing a company to open and operate two large mines. A railroad will be built to the lease from the Louisville & Nashville.

OBITUARY

John Gallagher, a well known coal man in eastern Ohio and an official of the Ohio and Pennsylvania Coal Co., was killed by a fall of slate recently while cleaning up a mine at Yorkville.

Richard J. Hughes, a former auditor for the Pennsylvania R.R. Co. in Philadelphia, died at his home in Altoona on Oct.

16. He was born in Ebensburg, Cambria County. Mr. Hughes was extensively engaged in the coal business, and was 80 years old.

F. M. Beyea, aged 55 years, of Monroe Ave., Dunmore, Penn., land agent for the Pennsylvania Coal Co., died at his home on Oct. 13, following a stroke of apoplexy, sustained several hours before while riding in a trolley car. His father died in the same manner on an Erie train several years ago.

Charles Sutton, aged 47, a prominent resident of Homer City, Penn., and an official of the Buffalo, Rochester & Pittsburgh Coal & Iron Co., at Luzerne, was fatally injured Oct. 18, when the automobile which he was driving collided with a street car. The glare from the car's headlight apparently blinded Mr. Sutton, and he drove his machine directly into the approaching trolley. He died from the effects of his injuries early on Oct. 19.

PUBLICATIONS RECEIVED

The Canadian Mining Institute Monthly Bulletin No. 29, September 1914. Seventy-one pages, 6x9 in. illustrated.

Department of the Interior, Bureau of Mines, Miner's Circular 16. "Hints on Coal Mine Ventilation," by J. J. Rutledge. Twenty-two pages, 6x9 in., illustrated.

Department of the Interior, Bureau of Mines, Bulletin 76. "United States Coals Available for Export Trade," by Van H. Manning. Fifteen pages, 6x9 in., with one map.

Department of the Interior, Bureau of Mines, Technical Paper 65. "A Study of the Oxidation of Coal," by Horace B. Porter and O. T. Ralston. Thirty pages, 6x9 in., with numerous curves, drawings and diagrams.

Department of the Interior, Bureau of Mines, Bulletin 83. "The Humidity of Mine Air with Special Reference to Coal Mines in Illinois," by R. Y. Williams. Sixty-nine pages, 6x9 in., with numerous tables, curves, and illustrations.

West Virginia Geological Survey, County Report for 1914, "Preston County." Cloth-bound volume of 566 pages, containing many halftones and tables. This volume is accompanied with a case of three maps showing the region in question.

The University of Illinois, Engineering Experiment Station, Bulletin No. 75. "Thermal Properties of Steam," by G. A. Goodenough, 69 pages, 6x9 in., with numerous curves. In this bulletin is described the development of a general theory of the properties of superheated and saturated steam. The equations employed are true throughout a range from 32° to 600° F., or a far wider limit than is at present employed in engineering practice.

TRADE CATALOGS

Morgan Gardner Electric Co., Chicago, Ill., Catalog 57. "Mining Locomotives." Forty pages, 10x7 in. illustrated.

Morgan Gardner Electric Co., Chicago, Ill., Catalog 55. "Continuous Coal Cutters." Thirty-two pages, 10x7 in., illustrated.

The Goodyear Tire & Rubber Co., Akron, Ohio. "Mine Equipment, Belting, Packing, Hose, Valves." Twenty-eight pages, 3½x6¼ in.; illustrated.

The Walter A. Zelnicker Supply Co., St. Louis, Mo. Bulletin No. 159, September, 1914. "Opportunities in Used Equipment." Eighty pages, 3¼x8¼ in.; illustrated.

Manistee Iron Works Co., Manistee, Mich., "Centrifugal Water Pumps, Rotary Jet Condensers and Air Pumps." Seventy-two pages, 8x10½ in. illustrated.

Link Belt Co., Philadelphia, Chicago, Indianapolis. "Link Belt Locomotive Cranes." Thirty-eight pages, 8½x11 in., illustrating the adaptation of the locomotive crane to the handling of various materials.

RECENT COAL AND COKE PATENTS

Smoke Precipitator. C. W. Lent, Byron, Calif., 1,103,304. July 14, 1914. Filed May 26, 1913. Serial No. 769,836.

Locomotive Stoker. N. E. Gee, Altoona, Penn., 1,103,406. July 14, 1914. Filed Oct. 15, 1912. Serial No. 725,960.

Furnace Grate. F. L. O. Wadsworth, Sewickley, Penn., 1,103,232. July 14, 1914. Filed Sept. 30, 1912. Serial No. 723,075.

Furnace for Boilers. R. F. Sturrock, Dundee, Scotland, 1,103,098. July 14, 1914. Filed Mar. 12, 1912. Serial No. 683,353.

Water-tube Boiler. W. D. Hoxie, assignor to Babcock & Wilcox, Bayonne, N. J., 1,102,407. July 7, 1914. Filed Jan. 12, 1912. Serial No. 670,750.

Boiler Arch Construction. E. P. Stevens assignor to Locomotive Arch Brick Co., Chicago, Ill., 1,103,447. July 14, 1914. Filed June 28, 1913. Serial No. 776,234.

Safety Apparatus for Mining Cages. S. W. Richardson and W. Stavelly, Hokitika, New Zealand, 1,103,841. July 14, 1914. Filed May 7, 1913. Serial No. 766,180.

Process and Apparatus for the Treatment of Coal and Shale in Vertical Retorts. A. Waddell, Dunfermline, Scotland, 1,103,112. July 14, 1914. Filed Sept. 11, 1913. Serial No. 789,306.

CONSTRUCTION NEWS

Indiana, Penn.—Work has recently been started on the survey on the Calderwood farm for a new coal opening.

Bakerstown, Penn.—The Sterling Coal Co. is putting into service two 12-ton barsteel locomotives recently ordered from the Westinghouse Electric & Mfg. Co.

Raven Run, Penn.—The Girard Mammoth Coal Co. recently ordered another 12-ton Baldwin-Westinghouse locomotive in order to handle its haulage problem more efficiently.

Charleston, S. C.—Work has been begun on the half million dollar coal plant which the Southern Ry. is erecting on the Cooper River, in the rear of Magnolia Cemetery.

Barnesboro, Penn.—The new tippie at the Marion mine of the Madeira-Hill Coal Mining Co. has recently been completed, and coal is now being shipped from the new structure.

Wilkes-Barre, Penn.—The Mill-Creek Coal Co. has awarded to C. K. Schupp of Wilkes-Barre, a contract for a large stripping operation, which will uncover thousands of tons of coal.

Johnstown, Penn.—H. E. Northens, of Johnstown, has purchased, with others, 63 acres of coal land at Bull Creek, near Tarentum. A modern tippie is to be erected at the mine which will be opened soon.

Mt. Carmel, Penn.—The Westinghouse Electric & Mfg. Co. recently received an order for four 10-ton barsteel locomotives from the Philadelphia & Reading Coal & Iron Co., to be placed in service at the latter's Alaska colliery.

Athens, Ohio.—The Hocking Power Co. is busy on the construction of the pole line which will carry its distributing system from the Floodwood power station to the various mines and towns which will take current therefrom. The machinery is all in place, and it is expected shortly that the latter will be put in operation.

Lansford, Penn.—The Lehigh Coal & Navigation Co. is installing at Nesquehoning and Seek, Penn., two 250-hp. Westinghouse synchronous motors direct connected to air compressors which replace steam driven units. The current for these installations comes from the Hauto plant of the Lehigh Navigation Electric Co.

East Liverpool, Ohio.—The Sugar Camp Coal & Clay Co., headed by J. J. Smith, who has for many years been connected with the Pittsburgh Coal Co., has taken leases on 500 acres of land extending from the eastern corporate limits of Chester up the river to Mill Creek. A corp of mining engineers was recently started at the work of testing out and proving the coal deposits.

NEW INCORPORATIONS

Hartford, Ark.—The Blackburn Coal Co. has been incorporated here, with Lillie Blackburn, president, W. A. Blackburn, vice-president, and C. M. Blackburn, secretary and treasurer.

Chicago, Ill.—The East Kentucky Coal Co. has been organized to develop 2500 acres of coal land near Richardson, Ky. The daily output of the mine will be 2000 tons.

Tacoma, Wash.—The Cassidy Coal Mine Co. has been organized at Tacoma with a capital stock of \$1,000,000, by J. L. McMurray and R. L. Sherrill. W. D. C. Spike is attorney.

Bramwell, W. Va.—The Cooper-Pocahontas Coal Co. has

been organized with a capital stock of \$70,000 for the purpose of operating coal mines in southeastern West Virginia. The incorporators are W. B. Honaher, of Matoaka, E. Cooper, C. H. Thomas, and W. A. Thomas, of Bramwell, and J. G. Thomas, of Mullins.

INDUSTRIAL NEWS

Penowa, Penn.—The Waverly Coal & Coke Co. has opened a new mine at Penowa, which, when developed, will give employment to several hundred men. William Fleming, of Virginville, W. Va., is superintendent of the new operation.

Moundsville, W. Va.—An important coal deal was recently consummated at Moundsville, eastern Ohio operators securing a controlling interest in the Parra Run mine. This mine is in operation, and will be continued so, the coal going to the markets formerly supplied by the territory across the river.

Scranton, Penn.—An agreement has been entered into between the Northern Coal Co. and the supervisors of Fell Township, whereby the company is to build and maintain the township roads in lieu of road taxes. The company has been taking care of the roads for years, and the arrangement has always worked satisfactorily.

Columbus, Ohio.—The Hocking Valley Ry. Co. has asked permission of the State Public Utilities Commission to issue \$4,000,000 of one year 6 per cent. gold notes, the proceeds to be used in refunding a similar quantity of outstanding notes due Nov. 1. The company stated that it was unable to indicate what price it would be able to get for the issue, on account of the financial situation.

Toledo, Ohio.—The receivers for the Cincinnati, Hamilton & Dayton R.R. Co. have filed a petition in the United States District Court to secure authority to transfer a portion of the holdings of the company in the Toledo Terminal R.R. Co., of Toledo, to the Hocking Valley Ry. Co. and the Toledo & Ohio Central R.R. Co. The object is to equalize the holdings of the railroads entering Toledo in the terminal belt line.

Washington, D. C.—The Alaska coal land leasing bill, revised at the instance of the President and Secretary Lane as part of the Administration's program for this session, awaits only the President's signature to become law. This bill is designed to open by a system of leases under competitive bidding the immense coal resources of Alaska, tied up for the last 8 years. Pending claims will be adjusted within 12 months.

Columbus, Ohio.—Clarence D. Laylin, assistant to Attorney General Hogan of Ohio, has filed a petition in the United States Supreme Court asking for the dismissal of the application now pending for a restraining order against the operation of the Ohio anti-screen law. The case was brought to the attention of the court at the last term when an application for the interlocutory injunction, filed in the U. S. District Court in northern Ohio was denied.

Scranton, Penn.—An order was recently issued for a parade of the mine workers to take place on Mitchell Day, Oct. 29, in the city of Scranton. The parade will begin at 1:30 o'clock and there will be a mass meeting immediately after in the baseball park. Addresses will be delivered by former president, John Mitchell; Stephen MacDonald, John P. Dempsey, Joseph Yaunis, and Alex. Kupstas. This will be the 14th anniversary of Mitchell Day.

Cairo, Ill.—The tow boat "Joseph B. Williams" was recently destroyed by fire at this point. When this vessel was built she was the largest craft of the kind in the world, and remained so until the steel-hulled tow boat "Sprague" was built for use on the Mississippi River. The "Joseph B. Williams" held the record of being the biggest wooden-hulled tow boat in existence until her destruction. She was built at Freedom, Penn., in 1876. She was 252 ft. in length, with a beam of 52 ft., and belonged to the Monongahela River Coal & Coke Co.

Columbus, Ohio.—That Columbus is expected to become a great coal and ore center is suggested by the vast construction program being pushed by the Hocking Valley and the Chesapeake & Ohio railroads. The city will be the terminus of a new line being built by the latter road as an outlet for the coal fields of West Virginia, Kentucky and Ohio. It will also be the transfer point in a scheme for the distribution of these fuels, and also the ores from the Northwest. The new road will connect with the Hocking Valley, which latter will double-track its line northward to the Lakes.

Coal Trade Reviews

General Review

Anthracite trade slowing up, due to the warm weather, and concessions on the circular are freely offered. Further restrictions and cancellations are the features of the bituminous market. Practically no spot demand.

The anticipated active business, succeeding the cold spell of early September, has failed to materialize because of the return of higher temperatures. The slowing up applies more particularly to the retail end, the wholesale business still being in a healthy condition; in fact, were it not for the mild season there would already be considerable anxiety about getting cargoes forward. The individuals are offering concessions down to as low as the May circular on some grades, while occasional cancellations are noted, and a continuance of the summer-like weather may necessitate a curtailment in mining operations. The heavy pressure for stove coal has entirely disappeared and straight cargoes of any reasonable amount are now readily available at the circular.

Further recessions are noted in the bituminous market in spite of the fact that it has been repeatedly felt that the bottom had been reached. Restrictions and cancellations on contracts are noted, while demurrage coal is beginning to appear, and there is a complete absence of any spot demand. The export business has been particularly disappointing. There are still some inquiries for foreign shipments, but the movement over the piers is light and confined almost entirely to contracts; exports are practically nothing insofar as any relief from the prevailing depression is concerned. Accumulations at the large distributing centers are reaching larger proportions, and the only thing that prevents a heavy slashing of prices is the general conviction that even this would not stimulate any buying.

The Pittsburgh situation continues in a distressing condition and there is no change in sight, with the exception of the coming close of navigation on the Lakes. Canadian business still remains abnormally flat, and the difficulty in moving slack continues one of the most serious problems for the time being. A more favorable movement in the Lake trade of Ohio has helped the situation there, especially as it was expected there would not be enough business to finish up the season. But in other lines, the outlook is most discouraging. The warm weather and curtailed steam consumption, due to the general heaviness in all lines of business, have reduced the demand to practically nothing.

The Southern market is under heavy pressure and the outlook is regarded as most discouraging; the market is even worse, if anything, and operations are heavily restricted. In the Middle West, a slight improvement is noted in spots, due to an occasional cool day creating a mild rush for coal. But on the whole, the October weather has been distinctly adverse to a good coal consumption, and the steam fuels are not being taken so well. One encouraging feature is that the producers were successful in resisting a determined effort on the part of the buyers to break the screening market.

ATLANTIC SEABOARD

BOSTON

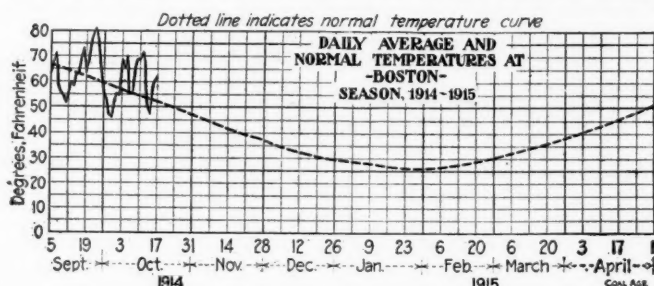
Pocahontas and New River situation critical. No spot market anywhere; contractors backward in taking coal. Slight improvement in demand for Pennsylvania grades. Georges Creek dull.

Bituminous—The export market having dwindled to small proportions, the Pocahontas and New River shippers are facing a rather critical time. Contractors are not taking anything like their normal requirements for October and there is no spot market anywhere. Cargoes here on the market meet with no response at all and there are several that have been awaiting disposal for ten days or a fortnight. Meanwhile, the volume on hand at the Hampton Roads loading ports continues to increase rather than diminish. If it were not for the conviction on the part of selling agents that even a radical cut in prices would not bring results, the \$2.85 figure would have been seriously slashed. Efforts have

been made looking to a general curtailment at the mines but it is too soon to expect any results.

Trade is somewhat improved for the better grades from Pennsylvania, especially in the all-rail sections. From Philadelphia there is a fairly steady movement in conjunction with anthracite shipments but the tonnages are small. Prices are fairly steady on all the coals that are favorably known.

Georges Creek is beginning to share the situation of Pocahontas and New River, so far as seeking orders is concerned, but f.o.b. prices remain firm at the contract figure.



Anthracite—The warm weather has had a depressing effect on retail trade and new business is rather slow coming in. The wholesale trade, however, is in a healthier state and with most of the shippers there is a little delay in getting cargoes cleared. Stove size is still in short supply, which is the reason for most of the slow dispatch.

Retail prices in Boston on bituminous were advanced Oct. 19, from \$4.65 to \$4.90 net ton, delivered. Anthracite screenings are quoted at \$3.25.

Bituminous prices at wholesale are about as follows:

	Clearfields	Cambria Somerset	Georges Creek	Pocahontas New River
Mines*	\$0.90@1.50	\$1.25@1.65	\$1.67@1.77	
Philadelphia*	2.15@2.80	2.50@2.90	2.92@3.02	
New York*	2.40@3.10	2.80@3.20	3.22@3.32	
Baltimore*			2.85@2.95	
Hampton Roads*				\$2.80@2.85
Boston†				3.60@3.78
Providence†				3.63@3.73

* F.o.b.

† On cars.

NEW YORK

More cancellations of bituminous orders and a further general contraction. Mining operations heavily curtailed. Anthracite under pressure due to the mild temperatures. Stove coal now plentiful.

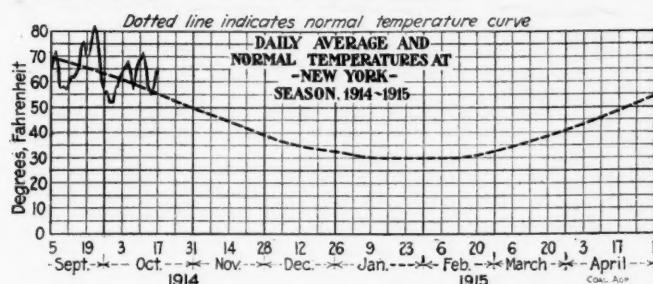
Bituminous—Even the most cheerful optimists are discouraged over the current situation in soft coal. Though not hopeful of any immediate improvement, it has been felt for some time that the situation would not contract any further, but the trade has experienced a severe disappointment in this respect. The past week has witnessed heavy cancellations, domestic consumers apparently restricting orders still further, while the general manufacturing and steam demand is notably reduced. There is practically no spot demand whatever, and the movement on contract is only fair. The necessity on the part of sellers to exert some pressure as regards credits is further aggravating the situation.

Operations in the mining regions are down to half capacity, and it is now agreed on all hands that the current situation could scarcely be worse. The only features of a constructive nature are the comparative absence of demurrage coal and the excellent manner in which prices are being maintained. Operators are rigidly curtailing production, so that accumulations are relatively insignificant considering conditions, while prices continue at a profitable figure, probably more because it is fully realized that concessions would not be productive of any results.

Occasional sales are reported at off figures, but the nominal market is not quotably changed from the prevailing level of the past few weeks, which we quote as follows: West Virginia steam, \$2.50@2.60; fair grades Pennsylvania, \$2.55@2.65; good grades of Pennsylvania, \$2.70@2.80; best Miller Pennsylvania, \$3.10@3.15; Georges Creek, \$3.15@3.25.

Anthracite—A continued absence of the customary cool fall weather has exerted a depressing influence upon the

hard coal market. The effects of this are being felt particularly in the line trade, and this has resulted in diverting an excessive tonnage of the individual prepared grades to Tidewater. Egg coal is suffering particularly, it being almost impossible to move it even when offered down to the full May circular. The heavy pressure for stove coal has also eased up notably, straight cargoes being readily obtainable at the circular. Nut coal is about normal.



Pea coal is moving rather freely, but the smaller sizes are heavy and difficult to dispose of. All the local dealers are complaining of the adverse weather conditions, and are anxiously awaiting lower temperatures. There are considerable tonnages going to Down East points, vessels being plentiful, with rates about normal. There are persistent rumors current to the effect that a move is on foot to advance the price of stove coal to the same as chestnut. No confirmation of this can be obtained at this time.

The New York hard coal market is now quotable on the following basis:

	Upper Ports		Lower Ports	
	Circular	Individual	Circular	Individual
Broken.....	\$5.10	\$4.65@5.10	\$5.05	\$4.60@5.05
Egg.....	5.35	5.10@5.35	5.30	4.85@5.30
Stove.....	5.35	5.35	5.30	5.30
Chestnut.....	5.50	5.50@5.60	5.55	5.45@5.55
Pea.....	5.55	5.45@5.55	5.50	5.40@5.50
Buckwheat.....	2.80	2.60@2.80	2.50@2.75	2.25@2.75
Rice.....	2.30	2.05@2.30	2.00@2.25	1.60@2.25
Barley.....	1.80	1.70@1.80	1.75	1.55@1.75

PHILADELPHIA

Anthracite inclined to lag, owing to unseasonable weather conditions. Partial suspension is expected, unless conditions change. Companies hampered with small sizes. Depression still marks bituminous situation, with little prospect of improvement.

Anthracite—The unseasonable weather has depressed the anthracite trade. It was expected that the month of October would compare favorably with the year previous, when uninterrupted operations were the rule and all sizes from broken to barley, found a ready market. Retailers who were induced to take on coal during the flurry late in September, still find themselves in possession of a good supply. The summer-like weather has restricted new business, many orders being cancelled, and the dealers are rather loth to take on additional supplies, until there is some prospect of disposing of what they have.

Outside of stove coal, the market is long on the other sizes. It is particularly hampered with the small grades which will not commence to move until the furnaces of the large apartment houses, hotels and office buildings are placed in operation. The individuals are also making things interesting for the large companies by substantial concessions on all sizes, but even at that, it is understood that the volume of business they are doing is not great. Unless conditions materially change, a curtailment in output is looked for.

Prices at Tidewater are about as follows:

	Circular	Individual
Broken.....	\$4.75	\$4.50
Egg.....	5.00	4.90 @ 5.00
Stove.....	5.00	5.10
Chestnut.....	5.25	4.80 @ 4.90

Bituminous—There is a depressed feeling in the trade. While considerable coal is moving on contracts, the spot business amounts to nothing at all, and the prospects for improvement are not satisfactory.

BALTIMORE

Bituminous market very flat. Industrial curtailment hits fuel business locally. Anthracite fairly satisfactory.

Anthracite is the best feature of a poor fuel situation generally. A slowly awakening demand on domestic account is being noted, and steaming coals, while in poor call, are not losing any ground and it is felt that purchasing for heating purposes can not be delayed much longer. Since Oct. 1 the trade has merely waited for cold weather.

There is little encouragement to be found in the soft-coal

market. In West Virginia and Pennsylvania many mines are still on a heavily curtailed basis. Car supply is more than sufficient under the existing circumstances. Cheap fuel is noted in all directions. West Virginia steam coals are selling around 80 to 90c. and three-quarter gas is freely offered around 90c. Slack holds its own at about 40c. The best Pennsylvania coals are still commanding \$1.35, but sales are relatively small. Lower grades are struggling along at from 95c. to \$1.15, with numerous partial cancellations reported.

The export trade will be about a fair average for the month. From charters now contracted, November seems likely to see another increase.

HAMPTON ROADS

Coastwise shipments from Hampton Roads fair. Foreign movement light and bunkering demand less than normal.

Coastwise shipments are only fair, while the movement foreign has been light and dumpings are consequently not showing up so well. So far as can be ascertained, practically all coastwise cargoes have been on contract and the foreign shipments are cargoes which were sold some weeks back. There are some inquiries in the market from foreign buyers but no reports have been made of any large spot sales for either coastwise or foreign shipment. There has been a fair movement of bunker coal, considering the war conditions, but it is not up to usual tonnage.

Prices on all grades remain about the same as they have been and although the supply of coal in the railway yards is perhaps still above normal, there is little prospect of any cut being made.

Of the cargoes cleared during the week the schooner "E. Starr Jones" took 1350½ tons for San Juan, Porto Rico. Large cargoes seldom move from Hampton Roads to Porto Rico, the average movement being by schooner and in small parcels.

COAL CHARTERS

The "Journal of Commerce" reports the vessel situation as follows:

Full cargo steamers are in good demand for October and November loading, particularly neutral boats, and as the supply available for prompt loading is exceedingly light, rates are decidedly strong and in some trades are quotably higher. The greater part of the prevailing demand continues to come from shippers of grain, coal and other cargo to transatlantic destinations, and there is also an increased demand for boats for South American business. A considerable number of boats were closed for grain and coal to Mediterranean ports and two neutral boats for coal to the River Plate, the rates in all cases being equal or better than the last previous fixtures of the kind. The sailing vessel market continues exceedingly slow in all trades and but little was done in chartering. Rates remain unchanged and the supply of available vessels is more than sufficient for the limited needs of charterers.

Coal charters have been reported as follows:

Vessel	Nationality	From	To	Tons	Rate
Bayard Barnes	.....	Newport News	Cay Francis	954	....
George F. Scannell	.....	Philadelphia	St. Croix	475	....
Humarock	.....	Philadelphia	Galveston	399	....
Clara E. Randall	.....	Philadelphia	New Orleans	863	....
Sylvia C. Hall	.....	Philadelphia	Jacksonville	285	....
F. A. Allen	.....	Philadelphia	Eastport	462	....
Lewis H. Goward	.....	Philadelphia	Porto Rico	1954	....
Margaret Thomas	.....	Philadelphia	Porto Rico	1161	....
Greenwich	British	Baltimore	Genoa	1878	....
Alderney	Norwegian	Baltimore	Havana	1970	....
Westerdijk	Dutch	Virginia	Montevideo	1988	....
Epsilon	Dutch	Virginia	Montevideo	2015	....
Primo	Italian	Virginia	West Coast Italy	2245	....
Adda	Italian	Baltimore	West Coast Italy	2179	....
Emanuel Accame	Italian	Baltimore	Savona	2175	....
Dagland	Norwegian	Philadelphia	Sagua	684	....
Egda	Norwegian	Philadelphia	Havana	1610	....
Elisha Atkins	.....	Baltimore	Boston	1049	....

Note—Steamers are indicated by bold face type, all others being schooners.

LAKE MARKETS

PITTSBURGH

Market continues quiet and prices irregular, slack still at 40@50c. Operations at about 50% capacity and Lake shipments likely to decrease soon.

Demand from retail dealers has been lighter the past week, on account of warmer weather. The dealers evince no disposition whatever to stock coal, and are buying merely as they distribute. Manufacturing demand shows little change, and there is no prospect of any improvement in this direction. The steel mills are constantly reducing their output. While their production is stated to be about 50% of

capacity the coal consumption is more than 50% of full requirements since coal consumption does not decrease as rapidly as output. Lake shipments are approximately holding their own, as compared with September but there are no signs of the long expected final spurt and it is not improbable that shipments will dwindle rapidly after Nov. 1.

Coal production in the Pittsburgh district is at about 50% of capacity, though on the basis of the best rate of shipment attained, operations are perhaps between 60 and 65%, the difference in the proportions being due to the fact that at best the mines are never able to work at capacity on account of car scarcity. Prices are fully as irregular as ever, and an evidence of the market weakness is that slack has shown no tendency whatever to firm up, even though the end of the Lake shipping season is near at hand. Slack is obtainable at 40@50c., or as low as at any time in the season. Excellent grades of coal are obtainable in prompt lots at \$1.15 for mine-run, and considerably below this is sometimes done. There is a little talk about circular prices being named for the new selling season, but it will likely be some time before the market definitely shapes itself and it is possible that no definite price announcement will be made. The old circular prices, purely nominal for months, were: Slack, 90c.; nut and slack, \$1.05; nut, \$1.25; mine-run, \$1.30; ¾-in., \$1.40; 1¼-in., \$1.50, per ton at mine, Pittsburgh district.

BUFFALO

Bituminous dealers believe prices and demand are at the lowest point. Slack very difficult to sell. Fair movement of soft coal. Lake trade drawing to a close.

Bituminous—There is nothing in sight likely to change the condition of the bituminous market except the closing of the Lake trade. It is a little early for that as yet but the making of an excessive amount of slack will soon be at an end for this year and it will then be a question whether the increase in the output of three-quarter will offset the decrease in slack.

The trade in Canada is quite dead; furnaces and factories are largely idle and the weather has been so warm all the fall that very little coal is needed for heating. These conditions will improve somewhat but the trade does not look for anything that will materially advance the price of coal. The prices on bituminous continue at the bottom, where they have been about all the year. Quotations are \$2.80 for Pittsburgh lump, \$2.70 for three-quarter, \$2.55 for mine-run and \$2.15 for slack with slack quite often going at most any price. Allegheny Valley sizes sell at 25c. lower than Pittsburgh. Youghiogheny slack commands a slight premium over almost anything else.

Anthracite—The demand is good, considering the warm weather. Shippers have sold about as much as they commonly do without the aid of cool weather and find that there is a steady improvement in the demand. The local trade is not quite as good as the line business, but it is bound to pick up. The demand for independent anthracite is active, though no premium is obtained for it.

Shipments of anthracite by Lake from this port are in fair quantity, though not by any means what they were last season. For the week they amounted to 104,000 net tons. Reports differ as to the Western anthracite trade. The latest statements are that it is very dull, so that it would be poor policy to rush any more than an ordinary amount in that direction till there is a better movement away from the docks.

CINCINNATI

Demand lighter in all departments and there is little prospect of improvement. The industrial situation is improving very slowly.

The demand during the past week has been even less than during the week before, if possible. Several cool days brought hopes of improvement in the retail trade, but it did not get cold enough and the movement remains very sluggish. Some of the local industrial consumers seem to be again receiving orders, but so far there has been no increase in the steam demand as has been hoped for. On the contrary, there is a marked hesitancy on the part of large consumers to either accept deliveries on contracts or buy spot coal. With both branches of the market in this non-buying humor, the trade seems to be in a deep rut.

COLUMBUS

Domestic trade is quiet due to warm weather. Price list weak but not demoralized. Lake trade continues active but steam grades dull.

Cancellations have been the rule among retailers, whose stocks are generally large. Their bins are full and orders booked for October are either being canceled entirely or shipment is being held up. Demand from the rural districts is small while a larger tonnage is being sold in the cities and

larger towns. Retail prices are fairly well maintained despite the weakness. Preference is still being shown for the fancy varieties such as Pocahontas and West Virginia splints. Anthracite is also moving quite freely in Columbus and vicinity.

The Lake market is still active and, on the whole, the best feature of the trade. A considerable tonnage is moving from Ohio mines to the upper Lake ports and congestion on the docks is not interfering to any great extent. Chartering of boats is still going on and there is every indication of an active Lake trade up to the closing of navigation. The Toledo docks of the Hocking Valley Ry. have loaded more than 2,000,000 tons since the opening of navigation in spite of the long suspension.

Production has fallen off because of the unfavorable weather conditions. The Hocking Valley is producing only about 65% of normal and the same is true of Crooksville and Jackson. Massillon and Cambridge is even lower. In the Pomeroy Bend district, which had held up well until recently, the output is estimated at 80% of the average.

	Hocking Valley	Pomeroy	Kanawha
Re-screened lump.....	\$1.76	\$1.75	.....
Inch and a quarter.....	1.60	1.60	\$1.50
Three-quarter inch.....	1.45	1.45	1.45
Nut.....	1.15	1.40	1.15
Mine-run.....	1.15	1.15	1.15
Nut, pea and slack.....	0.30	0.25	0.30
Coarse slack.....	0.20	0.25	0.20

TOLEDO

Lake movement much heavier during the past few weeks. Warm weather has caused a depression in the domestic market.

The domestic business has been practically at a standstill owing to the extremely warm weather. There does not seem to be any demoralization as yet, it simply being a dearth of demand. The steam business is not showing much improvement due to the fact that the money scarcity has brought about slow business conditions which are felt in every department of business. It was thought that business would improve when the crops began to move but the farmers concluded to hold their products for more money. The Lake trade is the one bright spot; there has been a good movement of coal in this direction, especially at the T. & O. C. docks.

Prices quoted in Toledo are:

	Hocking Valley	Cambridge	Pomeroy	Massillon	W. Va. Splint	Pocahontas
Lump.....	.....	.....	.....	\$2.50	.....	\$2.25
Re-screened Lump.....	\$1.70	.....	\$1.75	.....	.....	.....
Domestic Lump.....	1.60	.....	1.85	.....	\$1.60	.....
1¼ Lump.....	.....	\$1.40	.....	.....	.....	.....
¾ Lump.....	.....	1.20	.....	.....	.....	.....
Egg.....	1.25	.....	1.35	.....	1.15	2.25
4-in. Block.....	.....	.....	.....	.....	1.75	.....
Nut.....	1.25	.....	1.25	.....	.....	.....
Washed Nut.....	.....	.....	.....	2.50	.....	.....

CLEVELAND

Prices stronger due to the scarcity of coal. Market cleaned up Monday night for the first time in several weeks.

Slack prices have advanced from 5 to 15c. the last few days and spot coal is moving readily at \$1.60 to \$1.65 with shipment quotations at the higher prices rather than the lower. Even Hocking slack, that a week ago was sold as low as 5c. a ton at the mines, was stronger and high grade nut and slack were quoted \$1.55 to \$1.60. In this coal the advance is fully 20c. a ton.

Smokeless coals are holding at last week's prices because of the continued warm weather and a good supply. In Ohio and Pennsylvania domestic coals, the trading is at last week's prices, but the market is firm because of the small offerings. More than 200 cars of fine coal and steam size coarse coal came into the city over Sunday. A week ago it could not have been disposed of because of the large amount left on track, but late Monday afternoon the spot coal was all sold and Tuesday receipts were looked for to take care of additional business.

The real reason for the brisk market and the higher prices is the lack of orders for domestic sizes and for Lake shipment. The Lake business is practically over and only boats that can be held two to three weeks at the docks are being loaded. This has resulted in mines curtailing production.

Prices for current shipment are as follows:

	Pocahontas	Youghiogheny	Bergholz	Fairmount	W. Va. No. 8
Lump.....	\$3.75	.....	.....	.....	.....
Lump, 6 in.....	.....	.....	\$2.45	.....	.....
Egg.....	3.75	.....	2.10	.....	.....
Egg, 6 in.....	.....	.....	2.25	.....	.....
Lump, 1¼ in.....	.....	\$2.40	2.30	\$2.00@2.05	\$2.05
Lump, ¾ in.....	.....	2.30	2.10	1.90	1.95 65
Mine run.....	2.75	2.15	1.95	1.90	1.95 65
Slack.....	2.40	1.60@1.65	1.60@1.65	1.55@1.65	1.60@1.65

LOUISVILLE

The market is even worse, and operations are heavily curtailed. Outlook is regarded as discouraging.

The return of cool weather has had the effect of stimulating the demand for domestic coals in the Kentucky market but otherwise, conditions have shown little or no change.

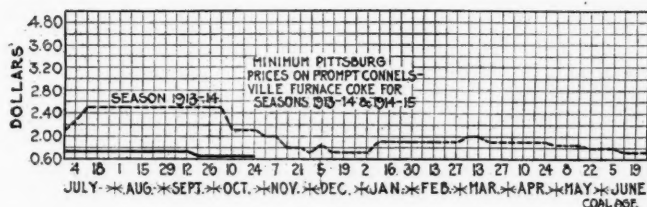
Although return of better conditions is spoken of with some optimism there is no immediate prospect of any industrial recovery that would put this market on its feet again. Some hope is expressed that the cotton will be moved and this would help the demand. Prices are not definitely quotable, whatever reasonable offer the operators can get usually being sufficient to close any deal.

COKE

CONNELLSVILLE

Coke market stagnant, with prices not seriously tested, but evidently a shade lower. Production and shipments declining.

There is no inquiry for foundry or furnace coke, and shipments on contracts are tending downward rather than upward, as consumptive requirements decrease. A little buying of November furnace coke is expected, but no inquiries are out yet. Prices are not being definitely tested, but would doubtless be found somewhat softer upon actual inquiry, and we reduce our range of quotations slightly, it being remembered that they are largely nominal: Prompt furnace, \$1.65; contract furnace, \$1.75; prompt foundry, \$2.25; contract foundry, favorite brands, \$2.35@2.50, per ton at ovens.



The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended Oct. 10 at 246,110 tons, a decrease of 3042 tons, and shipments at 244,593 tons, a decrease of 9259 tons.

BUFFALO

The coke trade is about as quiet as it could well be. The demand is so light that a great many dealers in coal are paying no attention to it. The movement is at a mere routine stage, with prices on the basis of \$4.25 for best Connellsville foundry and stock coke at \$3.30.

CHICAGO

Because of the let-up in the demand for furnace and foundry coke, most of the ovens are making storage piles. There has been a little better demand for domestic coke. Prevailing prices in Chicago are: Connellsville, \$4.75@4.90; Wise County, \$4.75; byproduct egg, stove and nut, \$4.95; gas house, \$4.35.

MIDDLE WESTERN

INDIANAPOLIS

Slight increase in the movement of domestic coal is noted. Screenings selling very low. Operators not expecting much before first half of November.

The weather has been adverse to the coal trade, except for two days when it was wet and inclined to be chilly. This caused a better movement of domestic coal from retailers' yards and had a corresponding effect at the mines. But outside of this, the October situation has been bad and the trade is not now expecting much before November. The screenings situation is about as poor as it could be and steam coals are not moving so well. Mines are on about half-time and cars are plentiful.

Screenings are selling at 30@50c. though a much higher price is obtained on contracts. The price of lump holds up well to \$1.75, although there are markets that will not take it at that figure.

CHICAGO

Conditions improving. Increase in the buying of both domestic and steam coal. Price on steam fuel advanced as a result of the curtailed production. Anthracite market stronger.

There has been a slight improvement in the Chicago market. Dealers report better buying of domestic coal and an increase in the demand for steam fuel. Steam prices have advanced as a result of a curtailed output, and the anthracite market has been improved by the raw weather. Prices are firmer, but no advances have been made. The smokeless market is active, due to a steady demand from apartment houses.

The major operators are getting \$1.40 at the mines for mine-run coal, while some of the smaller shippers are quoting \$1.25 as their minimum. There is a very light demand for splint coal. Cartersville operators report a slight improvement in both domestic and steam trade. The Franklin County market is stronger, the domestic lump price being \$2 a ton.

	Springfield	Franklin Co.	Clinton	W. Va.
Domestic lump.....	\$2.57	\$3.05	\$2.27@2.37	
Steam lump.....	2.02		1.97@2.02	
Egg.....		2.80	2.17@2.27	\$4.30
Mine run.....	1.87	2.15@2.25		
Screenings.....	1.07@1.12	1.40@1.50	1.07@1.12	\$3.30@3.45

Harrisburg quotations are: Domestic lump and egg, \$2.80; steam lump, \$2.20; mine run, \$2.15; screenings, \$1.40@1.50; No. 1 Nut, \$2.80; No. 2 nut, \$2.40.

Cartersville prices are: Lump, \$2.80; egg, \$2.55@2.80; No. 1 washed, \$2.65@2.80; No. 2 washed, \$2.30@2.40.

ST. LOUIS

Market flat on both steam and domestic grades. Most prices are less than production cost.

The depression in the coal trade still continues, with the exception of prices on the high-grade lump coals. In past years, when the steam market had gone to pieces at this particular time, the lump or domestic market was in good shape, but this year not only is the steam market flat, but there is absolutely no demand for the domestic sizes.

In the Standard field prices have gone to that point where there is no money in mining or producing coal. Screenings are sold at from 10 to 20c., and lump coal can be bought as low as 95c. The only thing that maintains the steam market is the fact that half the operators are dumping their steam sizes on the ground and this is not justified by a heavy domestic demand for lump coal as is usually the case at this particular season.

The prevailing circular is:

	Williamson and Franklin Co.	Big Muddy	Mt. Olive	Standard	Sparta
2-in. lump.....			\$1.30	\$1.00@1.10	\$1.15@1.20
3-in. lump.....			1.40		
3-in. lump.....	\$1.50@1.85		1.50	1.25@1.35	1.30@1.35
Lump and egg.....	1.85@2.15	\$2.25			1.35
No. 1 nut.....	1.25@1.40			0.75@0.80	
Screenings.....	0.30@0.40		0.80@0.85	0.10@0.20	0.20
Mine-run.....	1.05@1.10			0.75@0.80	
No. 1 washed nut.....	1.50@1.60	2.25	1.50		
No. 2 washed nut.....	1.25@1.35		1.35		
No. 3 washed nut.....	1.10@1.15				
No. 4 washed nut.....	1.00@1.05				
No. 5 washed nut.....	0.15@0.20				

KANSAS CITY

Domestic trade has been slightly brisker, but the usual fall demand is not fully under way.

Most business and office buildings have started their furnaces, but, although the weather was cold enough to demand fires in homes, many depended on gas to remove the chill, and there has been little demand in this direction. However, the cold snap proved that the gas supply will be inadequate this winter.

Coal Contracts Pending

Contract No. 2—Norfolk, Va.—The United States Government is in the market for 2000 tons of bituminous coal for use in waterway improvement work. Bids opened Oct. 12 were as follows: Pocahontas Fuel Co. (14,850 B.t.u.), \$2.63. Castner Curren & Bullitt, (14,600 B.t.u.), loading at city pier: Lump, \$3.545; mine-run, \$2.545; for loading at Lamberts Point: Lump, \$3.545; mine-run, \$2.59. New River Coal Co. (14,800 B.t.u.), \$2.55. Smokeless Fuel Co. (14,800 B.t.u.), \$2.53. C. G. Blake Co. (14,850 B.t.u.), \$2.55. Nottingham & Wrenn Co. (14,800 B.t.u.), \$2.58. Chesapeake & Ohio Coal & Coke Co. (14,850 B.t.u.), \$2.59 trimmed and \$2.57 not trimmed. Johns Bros. (14,800 B.t.u.), \$2.53. All communications should be

addressed to E. Eveleth Winslow, Lieutenant Colonel of Engineers, United States Engineer Office, Norfolk, Virginia.

Contract No. 4—Boston, Mass.—Rhode Island Co. is in the market for 90,000 to 100,000 tons of Pocahontas, New River, Georges Creek, or Somerset run-of-mine. Shipments are to be made in about monthly proportions for a year, and the point of delivery is Providence, R. I. All communications should be addressed to E. H. Raquet, Engineer of Tests, South Station, Boston, Massachusetts.

Contract No. 5—Boston, Mass.—New York, New Haven & Hartford R.R. is in the market for 250,000 tons of West Virginia (locomotive) coal, run-of-mine. Shipments are to be made in about monthly proportions for one year, the quotation to be either f.o.b. loading port or delivered alongside N. Y., N. H. & H. R.R. wharf, South Boston, Mass. All communications should be addressed to E. H. Raquet, Engineer of Tests, South Station, Boston, Massachusetts.

CONTRACTS LET

Contract No. 1—Columbus, Ohio—The Ruggery Building has contracted for 300 tons of West Virginia slack coal. Shipments are to be made at the rate of 25 tons per day, beginning Nov. 1, delivery to be made at Columbus, Ohio.

FOREIGN

Guayaquil, Ecuador, South America—La Compania de Alumbrado (Lighting Company) is in the market for 3500 tons of gas coal. Prospective bidders should state the specific gravity, weight per cubic foot, and space occupied by one ton of gas coal. Give approximate analysis including moisture, fixed carbon, sulphur and ash, and a commercial analysis showing the gas per ton of coal, gas per cubic foot of coal, illuminating power of the gas in standard sperm candles, value of one cubic foot in grains of sperm, sperm value per ton of coal, coke per ton of coal (good quality), coke per cent. of coal, ash in coke, sulphur eliminated with the volatile products, sulphur in the coke, tar per ton of coal. Quotations should be c.i.f. Guayaquil. Address The Manager, Compania de Alumbrado, Guayaquil, Ecuador, South America.

South America—An American consular officer in that country has transmitted detailed information relative to tenders which will be received, until Nov. 1, for the supply of coal for government steamer service. American coal dealers who are interested should apply to the Bureau of Foreign and Domestic Commerce, mentioning item No. 14,016 for the reserved information.

South America—Supplementing a previous notice, the Bureau of Foreign and Domestic Commerce at Washington states that details regarding a certain inquiry from South America have been forwarded to the department, and that complete information, including blank forms on which to submit bids for supplying coal under the conditions specified can be had on application. All inquiries should mention item No. 14048, and be addressed to the Bureau of Foreign and Domestic Commerce, at Washington, D. C.

Santiago, Chile, S. A.—Bids are wanted on 400,000 tons of coal, deliveries to be made during the next three years, according to press reports. The coal is to be used on the Chilean Railway. All communications should be addressed to the Department of Materials, Santiago, Chile, S. A.

FOREIGN MARKETS

GREAT BRITAIN

Trade slow and circulars difficult to maintain. Shipping further delayed by naval maneuvers in the North Sea. September exports make a substantial recovery.

The Spanish Government has reimposed the customs duties on imported coal.

The war has caused serious inroads into the funds of trade unions, owing to the increase of members requiring unemployment benefits. The Board of Trade now intimate willingness to make special grants to such bodies.—"The Colliery Guardian."

Oct. 9—Second class Admiralty List coals are in better demand and prices are harder. Monmouthshire large and Cardiff smalls are fairly plentiful. Quotations are approximately as follows:

Best Welsh steam.....	\$4.92@5.16	Best Mountmouthshires..	\$3.96@4.14
Best seconds.....	4.32@4.56	Seconds.....	3.84@3.96
Seconds.....	4.20@4.32	Best Cardiff small.....	1.98@2.04
Best dry coals.....	4.56@4.80	Seconds.....	1.32@1.56

Freight—Chartering is quiet, but rates remain firm for the Mediterranean, while for South America they are unchanged. Rates are approximately as follows:

Gibraltar.....	\$1.68	Aden.....	\$2.22
Malta.....	1.68	Colombo.....	2.34
Marseilles.....	1.76	Sabang.....	2.34
Algiers.....	1.56	Singapore.....	2.52
Genoa, Savona.....	1.96	Las Palmas.....	1.68
Naples.....	1.74	St. Vincent.....	1.80
Venice, Ancona.....	2.88	Rio Janeiro.....	3.12
Alexandria.....	1.92	Monte Video.....	2.82
Port Said.....	1.86	Buenos Ayres.....	3.06

British exports for September and the first nine months of the past three years were as follows:

To	September		Nine Months	
	1912	1913	1912	1913
Russia.....	592,060	668,472	17,398	3,107,885
Sweden.....	474,974	394,314	633,546	2,838,236
Norway.....	184,739	174,861	233,754	1,545,995
Denmark.....	273,030	275,724	405,842	1,960,592
Germany.....	826,208	833,326	.....	6,039,314
Netherlands.....	165,984	154,904	276,031	1,348,911
Belgium.....	132,118	164,448	44,416	1,060,822
France.....	918,275	1,040,489	569,667	7,187,864
Portugal.....	92,717	100,840	87,177	861,999
Spain and Canaries.....	260,910	270,678	227,401	2,393,304
Italy.....	760,006	810,994	697,693	6,453,595
Austria.....	65,104	53,761	.....	551,052
Hungary.....	45,140	76,091	19,264	455,916
Greece.....	50,233	30,103	.....	164,308
Roumania.....	47,482	51,501	.....	310,026
Turkey.....	258,775	258,232	133,177	2,149,506
Egypt.....	92,442	66,505	39,733	708,403
Algeria.....	.....	.....	.....	952,241
Portuguese West Africa.....	20,861	18,624	37,824	221,997
Chile.....	31,112	27,204	8,040	478,717
Brazil.....	137,842	158,896	59,528	1,123,160
Uruguay.....	106,144	65,642	18,866	622,986
Argentina.....	303,924	267,142	153,016	2,269,783
Channel Is.....	13,418	14,509	19,915	128,368
Gibraltar.....	32,941	14,940	24,447	251,033
Malta.....	36,658	36,249	13,649	268,504
Aden and Dependencies.....	10,907	22,930	22,125	149,278
British India.....	12,935	8,827	9,222	95,601
Ceylon.....	30,869	23,601	17,969	183,161
Other countries.....	99,751	111,373	89,488	820,107
Coke.....	97,679	125,357	130,264	680,713
Briquettes.....	125,373	179,041	107,001	1,115,631
Total.....	6,300,611	6,501,578	4,096,453	47,546,767
Bunker.....	1,593,347	1,825,057	1,332,935	13,202,091

* Includes Azores and Madeira. * Including Anglo-Egyptian Sudan.

PRODUCTION AND TRANSPORTATION STATISTICS

THE CAR SITUATION

The customary statement of the car supply, which always appears in this department, has been embodied in the article, "An Analysis of the Coal Car Situation," on page 662 of this issue.

IMPORTS AND EXPORTS

The following is a comparative statement of imports and exports in the United States for August, 1913-14, and for the eight months ending August, 1912-13-14, in long tons:

Imports from:	8 Months		August	
	1912	1913	1913	1914
United Kingdom.....	3,840	3,693	8m308	229
Canada.....	916,453	746,029	669,512	67,418
Japan.....	18,616	70,229	44,449	6,564
Austria and Tasmania.....	84,554	96,651	137,191	19,017
Other countries.....	1,925	2,816	2,053	6
Total.....	1,025,388	919,418	861,513	93,234
Exports:				
Anthracite.....	2,140,936	2,800,112	2,627,945	388,220
Canada.....	45,394	47,331	39,024	10,310
Other countries.....	.....	.....	.....	2,767
Total.....	2,186,330	2,847,443	2,666,969	398,530
Bituminous.....				
Canada.....	6,696,010	8,652,472	6,038,926	1,532,227
Panama.....	312,227	351,850	190,965	30,343
Mexico.....	224,561	377,098	315,068	26,137
Cuba.....	757,635	868,114	696,111	95,748
West Indies.....	480,410	419,496	415,796	42,032
Argentina.....	.....	48,626	138,219	.....
Brazil.....	.....	200,088	155,225	12,533
Uruguay.....	.....	5,163	56,514	5,163
Other Countries.....	1,197,509	911,604	1,138,436	82,316
Total.....	7,077,177	10,008,012	7,090,084	1,976,124
Bunker coal.....	4,943,257	5,079,189	5,027,956	669,919
Total.....	.....	.....	.....	1,339,086